

PROSPECTUS
OF
ARTS, SCIENCE, LAW AND
COMMERCE EXAMINATIONS
OF THE
University of Allahabad
FOR
1950

Price Rs. 2

THE NOEL MEMORIAL PRESS, ALLAHABAD
1948

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UNIVERSITY OF ALLAHABAD

CHAPTER XXIX

ORDINANCE

General Ordinances governing Admission to Examinations of Students of the University.

1. Every candidate for a degree shall, except when exempted by any of these Ordinances, be enrolled as a member of the University before entering upon the course prescribed for such degree.

Note.—For the qualifications for admission to the various courses and study, see Chapters XXXIV-XLII.

2. (a) A candidate for any University Examination shall not less than eight weeks before the date fixed for the commencement of the Examination—

- (1) pay into the office of the Registrar the fee prescribed for such examination ;
- (2) intimate the subject or subjects in which he desires to present himself for examination ; and

(3) along with his application for admission, furnish the Registrar with a certificate from the Head or Heads of the Departments of Teaching in which he studied, certifying that he has fulfilled the conditions laid down by these Regulations.

(b) In the case of students of the University, who reside in or are attached to a College or Hostel, the application of every such student who appears at any examination of the University must be forwarded to the Registrar through the Principal or Warden of the College or Hostel in which the student resides or to which he or she is attached; and the "Admit Card" of every such student shall be sent to the Principal of the College or Warden of the Hostel in which the student resides or to which he or she is attached.

3. The following fees shall be paid in respect of examinations held by the University :—

	Rs.
Bachelor of Arts	30
Examination previous to Master of Arts ..	20
Examination previous to Master of Education	20
Master of Arts	30
Master of Education (Final)	30
Bachelor of Science	30
Bachelor of Science (Honours)	20

	Rs.	Chapter XXIX
Each subsidiary subject in above	10	
Bachelor of Agricultural Engineering	30	
Examination previous to Master of Science ..	20	
Master of Science	30	
Doctor of Philosophy	150	
Doctor of Science	250	
Examination previous to LL.B.	30	
Bachelor of Laws	40	
Master of Laws	100	
Doctor of Laws	200	
Doctor of Letters	250	
Bachelor of Commerce, Part I	20	
Bachelor of Commerce, Part II	20	
Examination Previous to Master of Commerce	20	
Master of Commerce	30	
*Certificate of Proficiency in French or German or Italian	10	
Certificate of Proficiency in Military Science ..	10	
Diploma in Indian Music	10	
Diploma in Painting	10	
Examination in an optional subject open to a B. Com. of the University	10	
<hr/>		
*French and German	Rs. 1 - -	
French and Italian	Rs. 10-0-0	
German and Italian	Rs. 10-0-0	

[Vice-Chancellor's order, dated 9-2-1940—File No 481.1.]

Chapter
XXIX

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N. B.—The fee for examination in an optional subject in the B Com. Part II Examination. Rs. 10-0-0.

[*Vide E. C. Res. No. 82, dated 27-4-1940.*]

4. A candidate, who from sickness or other cause is unable to present himself for any examination, shall not receive a refund of his fee, provided that the Executive Council may, for sufficient cause, permit the candidate to present himself for the next ensuing examination without payment of a further fee and provided that the candidate makes an application for the purpose before July 31st following the examination for which he had paid the fee.

5. Except as provided by Ordinances, a candidate when admitted to one or more subsequent examinations shall, before admission, pay the prescribed fee for such examination on each occasion when he is so admitted.

6. Upon receipt of the fee prescribed, the Registrar shall furnish the candidate with an ad-

mission card, which will, on presentation, admit the candidate into the examination hall.

7. Permission to appear at a University Examination may be withdrawn for conduct which, in the opinion of the Executive Council, justifies the candidate's exclusion.

8. A candidate may not be admitted into the examination hall, unless he produces to the officer conducting the examination his examination admission card or satisfies such officers that it will be produced.

9. (1) If a candidate for any University Examination owes any money to the University on any account, the Vice-Chancellor may withhold or authorise the withholding of the admission card or cards of the candidate till all such money has been paid by him.

(2) If the Principal, Warden or Head of any College or Hostel recognised by the University or the President, Chairman or Treasurer of any Society or Association organised with the approval of the University for the benefit of the students or of the staff and students of the University, reports in writing to the Vice-Chancellor that any such candidate owes any money to the College or Hostel concerned or any money which the College

or Hostel authorities require residents or students attached to it to pay or any money to any such Society or Association, the Vice-Chancellor may either withhold or authorise the withholding of the admission card or cards of the candidate or may send the same to the Principal, Warden or Head of the College or Hostel or to the President, Chairman or Treasurer of the Society or Association concerned to be withheld till all such moneys have been paid.

(3) The Vice-Chancellor may take similar action if any such candidate fails, refuses or neglects to return any books, instruments or other property of the University or of any College or Hostel recognised by it or of any such Society or Association as aforesaid which have been lent to, or have otherwise come into the possession or custody of, the candidate concerned, or if a candidate fails, neglects or refuses to pay for any such books, instruments or property or to pay for any damage done to the same.

(4) If any Principal, Warden or Head of a Hostel or any President, Chairman or Treasurer of any Society or Association, desires the Vice-Chancellor to take action under Clause (2) or (3) of this ordinance, he must send to the University Office particulars of the sum or sums claimed by

him and the name and class of the candidate against whom the claim is made, at least three weeks before the date of the examination or the first examination (if more than one) at which such candidate has applied (or qualified) to appear.

10. No student of the University shall be allowed to appear at a University Examination unless he has attended 75% of the lectures and the tutorial classes separately in each subject during the course of instruction for the examination. In the case of a student studying a Science subject 75% of attendance during the course of practical work shall be required. In the case of students preparing for the LLB. Examination attendance at 75% of lectures in each paper shall be required :

Provided that in the case of students residing in a Hostel or a College no student shall be allowed to appear at a University Examination, unless he has kept 80% of the Hostel or College attendance. But the Vice-Chancellor may in special cases on the recommendation of the Warden or Principal concerned allow a period of grace not exceeding 10 days. Attendance during Moharram, Dasehra and Christmas holidays and the summer vacation will not be counted :

Provided also that a period of grace not exceeding 6 days in any subject may be allowed by

the Dean and of an additional period not exceeding 9 days by the Vice-Chancellor in case of (1) serious and prolonged illness of the student when it is supported by a medical certificate submitted at the time when the student was actually ill or (2) in very special cases for any other equally strong and sufficient cause.

The absence of a student on duty at the Camp of the University Training Corps, or at an athletic meet or a University Educational Excursion will be condoned ; provided that a certificate signed by a properly constituted authority is furnished within a week of the date of absence.

A properly constituted authority shall include the Officer Commanding the University Training Corps, the President of the Athletic Association, the Principals of Colleges and Wardens of Hostels and Heads of Departments as the case may be.

Notwithstanding any provision to the contrary, such students as are compelled, because of the War to discontinue their studies at Universities abroad, may be admitted to the University (if they possess the minimum qualifications for admission) and permitted to join at any time during the University session. They will be required to attend 75 p.c. of the lectures and tutorial classes separately in

each subject with effect from the date of their admission. Chapter XXIX

11. The Registrar may, if satisfied that an examination admission card has been lost or destroyed, grant, on payment of a further fee of Re. 1, a duplicate examination admission card. The card so granted shall show in a prominent place the number and date of the card originally granted.

12. The answer books of a candidate who fails by not more than three marks in any one subject, or in any one paper (in examinations in which minimum pass marks are required in individual papers), or by not more than six marks in the aggregate of all the subjects, shall be scrutinised by the Vice-Chancellor in consultation with the Head of the Department concerned, with a view to check if any question or part of a question has been left unmarked or if a mistake has been made in the addition of marks and to arrange for the rectification of such omission or mistake.

13. If any candidate desires to have his marks checked, he should apply to the Registrar within one month of the publication of the results and pay a fee of Rs. 5 and the Vice-Chancellor shall have the answer books rechecked and communicate result to the applicant.

14. The marks obtained by a candidate in

each subject will be communicated to him on payment of a fee of Rs. 2 ; in the case of M.A. and M.Sc. Examinations the marks obtained in each paper will be communicated.

15. Duplicates of University Certificates or Diplomas shall not be granted except in cases in which the Executive Council is satisfied by the production of an affidavit on a stamped paper of one rupee or otherwise that the applicant has lost his certificate or diploma, or that it has been destroyed. In such cases a duplicate of a certificate, the original of which was signed by the Registrar, may be granted on payment of a fee of Rs. 5; and a duplicate of a certificate or diploma, the original of which was signed by the Vice-Chancellor, on payment of a fee of Rs. 10.

CHAPTER XXX

Ordinances for Admission of Teachers to University Examinations

1. Bona-fide teachers in recognised Educational Institution situate within the territorial jurisdiction of the University who have taken degrees of the Allahabad University will be eligible not less than two years after graduation for

admission to the M. A. Previous or the M.A. Examination of the University by the permission of the Academic Council subject to the conditions laid down in these Ordinances.

2. A teacher who desires to enter for the M.A. Previous or the M.A. Examination of the University must apply to the Registrar in the prescribed form not less than six months before the examination, and must enclose with his application the following :—

(a) A certificate from an Inspector of Schools or the Head of the Educational Institution in which he has taught last that he has served continuously as a teacher for at least 18 months in one or more institutions recognised by the Board of High School and Intermediate Education, U.P., or the Department of Public Instruction, U.P., or the University of Allahabad and that before the commencement of such service he had passed the B.A. or the B.A. 3rd Year or M.A. Previous Examination of the University.

(b) A certificate of character from an Inspector of Schools or the Head of the Educational

Institution in which he has taught during the period prescribed in clause (a) of this Ordinance ;

- (c) The prescribed fee for the examination ;
- (d) The enrolment fee of Rs. 10 for becoming a member of the University.

3. Where a candidate applies for permission to appear at a University Examination and his application is rejected, Rs. 8 out of the Rs. 10 paid under ordinance 2 (d) shall be refunded to him.

CHAPTER XXXI

Re-admission to University Examinations Ordinances

1. A candidate who after passing the Previous
 Section 32 (c) M.A. or M.Sc., (Mathematics) Examination or the B.A. Third Year Honours Examination or the B.Sc. Honours Examination in Mathematics, has attended a regular course of study for one year in the University for the Final Examination for the same degree may be allowed by the Executive Council to appear at any subsequent examination for such degree without attending any further regular course of study : provided that his application is recommended by the Dean of the Faculty concerned and provided also that the candidate takes the subsequent exa-

mination within five years of his having attended a regular course of study. Chapter
XXXI

2. Same as otherwise provided by the Ordinances elsewhere a candidate who has failed once in a University Examination or, having completed the required percentage of attendance for the Examination, has been prevented from appearing by illness or other cause, may be admitted to a subsequent examination without attending the regular course of studies provided that :—

- (i) he remains a student of the University and further ;
- (ii) provided that he takes the subsequent examination within five years following the year in which he failed last or failed to appear after completing attendance.
- (iii) not less than six months before the date fixed for the next examination he sends an application together with a fee of Rs. 2 to the Registrar setting out—
 - (a) the conditions under which he has been studying and is now proposing to continue his studies.
 - (b) the dates of his previous failures to pass or to appear in the examination.

3. A candidate who fails in the practical examination will be required to produce a certificate from the Head of the Department to show that he attended the Practical course for one session at least after his first failure or failure to appear.

4. (a) Any candidate who has failed at the B.A. Examination in one subject or either in the written papers or in the Practical of a subject (but not in both in which it is necessary to pass separately, and obtained not less than 25% marks in the subject and 40% marks) in the aggregate of other subjects shall be admitted to the Supplementary Examination in that subject, without further attendance and, if successful, shall be declared to have passed the B.A. Examination without being placed in any division.

(b) Any candidate who has failed at the B.Sc. Examination or the B.Sc. Special Examination for girls either in the written papers or in the Practical in a subject, (but not in both written and Practical) and obtained at least 25%

marks in that subject and 40% marks in the aggregate of other subjects, shall be admitted to the Supplementary Examination in that subject without further attendance and, if successful, shall be declared to have passed the B.Sc. Examination without being placed in any division.

(c) Any candidate who has failed at the B.Sc. (Agr.) or B.Sc. (Agr. Eng.) Examination *either*.

(i) in one written paper or in one Practical in one group of subjects and obtained 33% marks in the aggregate of that group and 40% marks in the aggregate of other groups.

or

(ii) in one group securing between 25% and 33% marks in that group and obtained 40% marks in the aggregate of the other groups provided he has passed in each paper and Practical.

Shall be admitted to the Supplementary Examination in that group without further attendance and, if successful,

shall be declared to have passed the B.Sc. (Agr.) or the B.Sc. (Agr. Eng.) Examination without being placed in any division.

(d) Any candidate who has failed at the B.Com. Part I or B.Com. Part II Examination (but not in both) and obtained between 25% and 10% marks in one group and 40% marks in the aggregate of the remaining groups shall be admitted to the Supplementary Examination in that group without further attendance and, if successful, shall be declared to have passed the B.Com. Part I or B.Com. Part II Examination without being placed in any division. No candidate shall be declared to have passed the B.Com. Examination unless he has passed the B.Com. Part I Examination.

(e) Any candidate who has failed at the LL.B. (Previous) or the LL.B. (Final) Examination and obtained between 27% and 30% marks in one paper and 50% marks in the aggregate of all the papers or any candidate who has passed in all the

papers but failed in the aggregate by not more than 6 marks, shall be admitted to the Supplementary Examination in the paper in which he has failed or in all the papers if he has failed in the aggregate without further attendance, and, if successful, shall be declared to have passed the Examination without being placed in any division.

5. Notwithstanding any provision to the contrary, candidates who appear and fail at the Supplementary Examination or are unable to appear shall, if appearing in a subsequent examination, be required to appear in all subjects.

Candidates who appear at the B. Com., Part I Supplementary Examination after obtaining pass marks in the B. Com., Part II Examination and fail to pass or are unable to appear shall be required, if appearing in a subsequent examination, to appear in all the subjects of both the Parts.

6. The fee for the Supplementary Examination shall be Rs. 25 per candidate.

7. Every ex-student who wishes to appear at subsequent examinations shall pay an annual fee of Rs. 5 in order to retain his membership of the University. Law students must pay this fee from 1925 onwards.

Chapter
XXXIV

8. Notwithstanding any provision in the Ordinances to the contrary a student of the University who is on War Service may be permitted till two years after the termination of the War to appear at a University examination at which he was due to appear even if he has not attended a regular course of study or kept the prescribed College or Hostel attendance.

9. Notwithstanding any provision to the contrary, a student who has attended a regular course of study for two years and qualified himself to appear at the B A., B.Sc. and B.Com. Examination, or has failed at the Examination may be permitted to change a subject and appear at the examination after regular attendance in the new subject for one year.

CHAPTER XXXIV

General Ordinances Relating to Degrees

1. In Chapters XXXI and XXXV to XXXVIII, the expression "a regular course of study," means attendance at such percentage of lectures and other teaching in the subject or subjects for the examination at which a candidate intends to appear, and at such other practical work (such as work in a laboratory) as is required by any Ordinance, Regulation or Rule in force for the time being in the University.

2. Where there are two examinations for any degree or diploma, such as a Previous and a Final Examination, and there are two or more alternative courses for such a degree or diploma, a candidate for the degree or diploma must take the same course in the Final Examination as he has taken in the Previous Examination, provided that, if there are two examinations, an examination for honours and an examination for a pass, in the same subjects or subjects, a candidate who has passed the previous examination with honours may take the pass course for the final examination ; but a candidate who has not passed the previous examination with honours cannot take the honours course for the final examination.

***General Ordinances for Admission to
Under-graduate Classes**

3. Students who have passed the Intermediate Examination of the Board of High School, and

* Accepted by the Faculty of Commerce subject to such restrictions as the Faculty deems it fit to impose from time to time.

The Preliminary Examination of the Mayo College, Ajmer, has been recognised as equivalent to the Intermediate Examination of the U. P. Board.

The Intermediate Examination in Agriculture of the Nagpur University has been so recognised for admission to B. Sc. (Ag.) of the University.

Intermediate Education of the United Provinces, or of any University in British India incorporated by any law for the time being in force, or any examination recognised by the Academic Council as equivalent thereto, may be admitted to the undergraduate classes of the University.

The Higher School Certificate Examination conducted by the Syndicate of the University of Cambridge, the Intermediate Examination conducted by the Board of High School and Intermediate Education, Rajputana (including Ajmer-Merwara), Central India and Gwalior, and the Intermediate Examination of the Mysore University have been so recognised by the Academic Council. The Intermediate Examination of the Dacca Board of Intermediate and Secondary Education has also been so recognised by the Academic Council, provided that a candidate passes in addition to the present compulsory subjects in English and *any three* of the following subjects:—

History or Geography; Logic; Mathematics; Economics; Classical Language; Physics; Chemistry; Botany; Physiology; Urdu; Hindi or Bengali.

The Intermediate Examination in Arts and Science of the Andhra University with Banking, Accountancy and Commercial Geography has been so recognised.

The First Examination in Agriculture of the Punjab University has been recognised as equivalent to the Intermediate Examinations in Agriculture for admission to B. Sc. (Ag.) of the University.

That the Intermediate Examination of the Rangoon University has been recognised as equivalent to the Intermediate

Eligibility for Admission to the (1) Bachelor of Arts (Home Arts) and (2) Bachelor of Science (Home Science) Examinations for Women

Candidates only.

3 (c). (1) Women students who have passed the Intermediate Examination of the Board of High Examination of the Board of High School and Intermediate Education, U. P.

The Queen's Scholarship Examination for the Straits Settlement has been recognised.

The Intermediate Examination of the London University (external side).

The Intermediate Examinations in Commerce of the Nagpur, Benares and Aligarh Universities have been recognised as equivalent to the Intermediate Examination in Commerce of the U. P. Board. The Travancore University has been so recognised.

The Final Examination for the full course Certificate of the Government Commercial Institute, Calcutta, after having passed the Matriculation or any equivalent examination of any University or Board Established by law in India has been recognized as equivalent to the Intermediate Examination, U. P., for admission to the B. A. Class.

The Intermediate Examination in Agriculture of the Muslim University, Aligarh has been recognised for admission to the B.Sc. Ag. and B. Sc. Agl. Eng. classes of this University.

The Engineering Examination of the Board of Delhi University, has been recognised as equivalent to the Intermediate Examination of the U. P. Board.

The Intermediate Examination in Science of the London University has been recognised for admission to the B.Sc. Class.

School and Intermediate Education of the U. P. Board or of an University in British India recognised by the Academic Council of the University as equivalent thereto, will be eligible for admission.

(2) Women students who have passed the Intermediate Examination of the Board of High School and Intermediate Education of the U. P. Board or of an University in British India recognised by the Academic Council of the University as equivalent thereto and who have offered Science either at the High School or at the Intermediate Examination, will be eligible for admission.

4. A student who has (1) passed any of the following examinations—the Fazil Examination in Arabic or Kamil Examination in Persian conducted by the Education Department of the United Provinces, the Acharya Examination of the Government Sanskrit College or of the Benares Hindu University, the Dabir Kamil or Fazil Examination of the Lucknow University, the Acharya Examination of the Jaipur State, the Ratna Examination of the Hindi Sahitya Sammelan, the Shastri or Maulvi Fazil or Munshi Fazil Examination of the Punjab University, the Saraswati Examination of Prayag Mahila Vidapith and (2) has also passed in English the Intermediate Examination of the U.P. Board of High School and Intermediate will be eligible for admis-

sion to the University and after a regular course of study extending over two academic years will be eligible to appear at the B.A. Examination in English only. If successful he will be granted certificate of having passed the examination in English only.

General Ordinances for Admission to Post-graduate Classes .

5. Any graduate of the University or of any other University in British territory recognised by the law of the place in which it is situated, or of any University* which the Academic Council may from time to time recognise for this purpose, may be admitted to the classes for post-graduate degrees in the University, provided that, only those who have passed the examination for an Honours degree of the University or, as the case may be, have passed the previous examination, if any of this University for a post-graduate degree may be admitted to the final class for that degree.

*(i) The Mysore University has been so recognised (*vide* Ac. C. Res., No. 15, dated 11-3-1927).

(ii) B. Sc. (Ag.) Examination of the Agra University has been recognised for purposes of admission to the M. Sc. Previous Class in Botany and Zoology (Ac. C. Res. No. 15, dated 6-3-1940).

(iii) The Travancore University has been so recognised.

(iv) Graduates in Agriculture are eligible for admission to the Law Classes.

6. No graduate of another University shall be admitted to the course of instruction for an examination for which he is not eligible in the University at which he graduated.

7. The number of lectures to be delivered for any examination for a post-graduate degree shall not be less than 100 in each academic year.

CHAPTER XXXV

A

Ordinances for the Degree of Bachelor of Arts (Pass)

1. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at this examination.

2. The examination for the pass degree of Bachelor of Arts shall be conducted by means of papers, and may include a viva voce examination.

3. Every candidate for the pass B.A. Degree shall be required to show a competent knowledge of three branches of study in addition to Compulsory English.

(1) Compulsory English.

(2) Any three of the following branches :—

The Intermediate Examination in science of the London University has been recognised as qualifying for admission to the B. Sc. Class of this University (Ex. Council Resolution No. 73, dated 29th April, 1944).

- (a) English Literature.
- (b) Latin, Greek, Hebrew, Arabic, Persian or Sanskrit, Hindi or Urdu, Bengali, Gujrati, Marathi, French, German or Italian.
- (c) Mathematics.
- (d) Philosophy.
- (e) Education.
- (f) Economics.
- (g) History
- (h) Geography.
- (i) Politics.
- (j) Military Science.*
- (k) Music.†
- (l) Experimental Psychology.

**Note.*—Open only to the members of the U. T. C.

†*Note.*—Open only to women students, who have passed the Intermediate or an equivalent examination with Indian Music as an optional or additional optional subject, or any of the following examinations if they have passed the Intermediate Examination without taking Indian Music as one of the optional subjects :—

- (a) Diploma Examination or Junior Diploma Examination of the Allahabad University in Indian Music.
- (b) Intermediate Examination of Marris College of Music, Lucknow.
- (c) Intermediate Examination of Madhava School of Music, Gwalior.

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4. Any candidate who has Passed the B. A. Examination of the University shall be allowed to present himself for examination at any B. A. examination of the University in any subject in which he has not previously passed the examination, provided he has attended a regular course of study in the University in the subject for at least one year, provided also he is not prevented from offering the said subject at the B.A. Examination by the rules of the University. If successful he will be granted a certificate to that effect.

B**ORDINANCES FOR THE DEGREE OF
(1) BACHELOR OF ARTS.****(Home Arts.)**

1. Courses of study for the Degree of Bachelor of Home Arts shall extend over a period of two academic years and the degree examination shall be held at the end of the second academic year.

2. Girls who pass the Intermediate Examination of the U. P., Board or any examination recognised as equivalent by the University shall be eligible for admission to this course.

3. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at the examination.

4. Every candidate shall be required to pass in the following groups of subjects :—

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(i) Sociology :—Two papers.

Paper I. Home Economics.

Paper II. Psychology with special reference to Child Psychology, or Ethics.

(ii) Household Arts

Group A. Two papers.

Paper I. Principles of Arts and Design and Practical.

Paper II. (a) Cookery, or (b) Textiles and Practical.

Or

Group B. Music.

Paper I. Theory.

Practical.

Or

Group C. Painting.

Paper I. Theory.

Practical.

(iii) Science. Two papers.

Paper I. Physiology, Hygiene, Bacteriology and Practical.

Paper II. Elementary Chemistry, Nutrition, Dietetics, and Practical.

5. A candidate may, at her option, take Compulsory English as an extra subject. The marks obtained by the candidate shall not be counted towards her aggregate and the class obtained by her in Compulsory English shall be indicated in her diploma and notified in the Gazette.

Regulations.

1. The examination for the degree of Bachelor of Home Arts shall be by means of papers, but candidates shall be required to undergo a practical examination where specifically provided.

Candidates shall be required to pass separately in the practical examination.

2. The names of the successful candidates shall be arranged in three classes. Candidates who obtain 60% of the aggregate marks or above shall be placed in the first class. Candidates who obtain 48% or more but less than 60% of the aggregate marks, shall be placed in the second class. Candidates who obtain 33% or more, but less than 48% of the aggregate marks, shall be declared to have passed in the third class. The names shall be arranged in alphabetical order within the classes.

3. Candidates must obtain at least 33% of the total marks in each subjects.

4. The examination in Compulsory English shall be the same as for the B.A. degree.

Marks Assigned.

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	Marks	Minimum pass marks
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I. Sociology.

Paper I. Elementary Eco-		
nomics	100	33

Paper II. Psychology or		
Ethics	100	33

II. Household Arts.

GROUP A.

Paper I. Arts and Design.

Theory	25	} 17
Practical	25	

Paper II. Cokoery.

Theory	50	} 50
Practical	100	

Or

Textiles.

Theory	50	} 50
Practical	100	

Chapter
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GROUP B.

		Marks	Minimum pass marks.
	Music.		
Paper I	Theory ..	50	17
Practical	150	50

Or
GROUP C.
Painting.

Paper I.	Theory ..	50	17
Practical	..	150	50

III. Science.

Paper I.	Physiology, Hygiene, Bacteriology, etc.	50	1
	Practical ..	50	17
Paper II.	Elementary Chemistry Nutrition, Dietetics, etc.	50	17
	Practical ..	50	17

Candidates will be required to pass separately in Theory and Practical test except in Group A.

C**Ordinances for the Degree of Master of Arts**

1. The examination for the degree of Master of Arts shall consist of two parts :

(1) The Previous Examination and (2) the Final Examination.

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2. A candidate, who after passing the examination for the degree of Bachelor of Arts (Honours), or the M.A. Previous Examination, has completed a regular course of study for not less than one academical year in the University in the subject in which he has passed the Examination for the degree of Bachelor of Arts (Honours) or the M.A. Previous Examination (but not in any other subject) shall be admitted to the Examination for the degree of Master of Arts.

3. (a) A candidate who has taken the degree of B. A. (Pass) of the University or of any other University to which Ordinance 5 of the General Ordinances, Chapter XXXIV, applies and who wishes to proceed to the M.A. degree may be admitted to the course for the M.A. (Previous) examination in any one of the subjects offered by him in the examination for the B. A. (Pass) degree, or in any other subjects provided the Head of the Department of teaching in the subject and the Dean of the Faculty consider the subject to be allied to one of the subjects offered by the candidate for the B.A. (Pass) degree, and provided also that he satisfies the Head of the Department concerned of his fitness for admission to the course. Such candidate if success-

ful in the M.A. (Previous) examination shall be permitted to proceed to the M.A. Final examination.

A candidate who has taken the degree of B.Com. of the University or of the Lucknow University and who wishes to proceed to the M.A. Degree in Politics may be admitted to the course for M.A. (Previous) examination and such a candidate if successful in the M. A. (Previous) examination shall be permitted to proceed to the M.A. (Final) examination.

A candidate who has taken the B.A. (Pass) degree and who wishes to proceed to the degree of M.A. in Mathematics may be admitted to the course for the M.A. (Previous) examination in Mathematics and if successful shall be permitted to proceed to the M.A. (Final) examination. The course for the M.A. (Previous) examination shall be the same as for the M.Sc. (Previous) examination unless otherwise determined by the Faculty of Arts.

(b) A B.Sc. (Pass or Honours) or B.Com. who wishes to proceed to the degree of M.A. may be admitted to the course for the M.A. Previous examination and to the examination thereafter, with the permission of the Head of the Department concerned: Provided (i) that the Head of the Department and the Dean of the Faculty grant his applica-

tion and (ii)* that before he is admitted he passes in a written test in the subject which he proposes to take, the test to be conducted by the Head of the Department concerned.

(c) A candidate who has passed the examination mentioned in Clause (a) of this ordinance may be admitted to the examination for the Degree of Master of Arts if he completes a regular course of study for not less than one academical year in the University in the subject in which he passed the examination mentioned in Clause (a) of this Ordinance.

4. The subjects of examination for the degree of Master of Arts shall be the following:—

- (1) Languages.
- (2) Mental and Moral Science.
- (3) History.
- (4) Mathematics.
- (5) Economics.
- (6) Politics.
- (7) Geography.

5. The examination in Languages shall be in English or in one of the following languages, *viz.*, Sanskrit, Arabic, Persian, Greek, Latin Hebrew, Hindi, Urdu, French, German or Italian.

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6. The examination in any language, other than Sanskrit, shall include the languages, Literature and History of the country to which it belongs.

7. The examination in Sanskrit shall include the Sanskrit language, Literature, Philosophy or early Indian History.

D

Ordinances for the Degree of Doctor of Philosophy.

1. A candidate for the Degree of Doctor of Philosophy must be either—

- (i) A Master of Arts of this University; or
- (ii) A Master of Arts of any other University recognised by this University.

2. The candidates shall apply for admission to the University stating his qualifications and the subject he proposes to investigate, and enclosing a statement of any work he may have done in the subject.

3. The application shall be placed before a Research Degree Committee consisting of the Vice-Chancellor, the Dean, and the Head or Heads of Departments concerned; they shall have power to co-opt two other members. This Committee shall satisfy itself that the subject offered is one which

can be profitably pursued under the superintendence of the University and that the candidate possesses the requisite qualifications and equipment. If the Committee is satisfied on these points, it shall grant the application for admission and appoint a member of the teaching staff to guide the work of the candidate. The proceedings of the Committee shall be reported to the Faculty at its next meeting.

4. Every candidate shall pursue as a student of the University a course of research of not less than 20 months' duration.

Note.—A teacher of this University shall be considered to be a student for the purpose of this ordinance.

5. He shall pursue his research at Allahabad unless the Vice-Chancellor, on the recommendation of the Supervisor, gives him leave of absence for ordinarily not more than one year on the ground that it is in the interest of his research that he should work elsewhere.

6. A candidate may, not later than one year after his admission, modify the scheme of his subject with the approval of the Committee.

7. Candidates for the D. Phil. degree shall ordinarily be required to submit their thesis within three years of their admission as D.Phil. Scholars, but in special cases, it would be open to the Vice-Chancellor to extend the period on the recommenda-

tion of the Supervisor concerned.

8. On a report from the Supervisor that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint three Examiners two of whom shall conduct the viva voce examination if necessary. The Supervisor shall ordinarily be one of the examiners.

9. After the thesis is completed the candidate shall supply five printed or typed copies of his thesis which shall comply with the following conditions.

It must be a piece of research work characterised either by the discovery of facts, or by a fresh approach towards interpretation of facts or theories ; in either case it should evince the candidate's capacity for critical examination and judgment. It shall also be satisfactory so far as its literary presentation is concerned, and must be suitable for publication.

10. The candidate shall indicate how far the thesis embodies the result of his own research or observations and in what respects his investigations appear to him to advance the study of his subject.

11. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject which he may have published independently or conjointly. In the event of his submitting such subsidiary matter he shall be required to state fully his own share in

any conjoint work.

12. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject but he shall not submit as his thesis any work for which a degree has been conferred on him in this or any other University.

13. The examiners shall examine the thesis and shall submit their reports on the prescribed form either conjointly or separately. The examiners, may consult one another before formulating their reports. They may make such suggestions as they deem fit for the improvement of the thesis.

14. After the examiners have read the thesis, they may recommend that the thesis be rejected or that the candidate be allowed to represent his thesis in a revised form not earlier than six months and not later than two years from the date of the decision of the Faculty.

15. If the majority of examiners report that the thesis is satisfactory, the University shall arrange for the viva voce examination if so directed by one or more of the examiners.

16. If the viva voce examiners are also satisfied, the recommendations of the thesis and viva voce examiners shall be placed by the Research

Degree Committee before the Faculty for necessary action.

17. The Faculty shall accept all unanimous recommendation or recommendations made by a majority of the examiners. In the event of no definite recommendations being made by a majority of examiners the Faculty may allow the candidate to represent the thesis or may appoint one or more fresh examiners to examine the thesis.

18. In case the recommendation of the viva voce examiners differs from the recommendation of the examiners of the thesis the candidate may be asked to re-appear at the viva voce examination within one year. If the candidate fails to satisfy the viva voce examiners a second time he shall be rejected.

19. No candidate shall be allowed to represent his thesis more than once or to re-appear at the viva voce examination more than once.

20. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D. Phil. degree of the Allahabad University.

21. The following fees shall be charged :—

- (a) A fee for guidance and supervision of work as laid down in Ordinance 19 (2) of Chapter XXVII.

(b) A fee of Rs. 150 for the examination.

22. Each Examiner shall be paid a fee of Rs. 50 for reading the thesis and a fee of Rs. 50 for examining the candidate viva voce.

Note.—When an Examiner conducts the *viva voce* examination and is also one of the Examiners to assess the thesis he shall be paid only Rs. 75.

23. The Faculty may exempt a candidate from the conditions laid down in Ordinance 4, provided that he had carried on research at this University prior to the coming into force of these ordinances.

UNIVERSITY OF ALLAHABAD

FACULTY OF ARTS

Report of Examiners for D. Phil. Degree.

The Examiners report that....student of....
Department has presented a thesis entitled....for
the Degree of Doctor of Philosophy.

Part I—(For the Examiners of the thesis
only).

A.—The Examiners report after the examination of the thesis—

(i) that the thesis submitted by the candidate
is a piece of research work characterised—

(a) by the discovery of facts ; or

(b) by a fresh approach towards inter-

pretation of facts or theories ;
and

- (ii) that the thesis evinces the candidate's capacity for critical examination and judgment ; and
- (iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Philosophy in the University of Allahabad.

B.—After the examination of the thesis, the Examiners recommend that the candidate be rejected without further test.

C.—After the examination of the thesis, the Examiners recommend that the candidate be permitted to re-present the thesis in a revised form.

Part II.—(For the Examiners of a viva voce Examination).

The Examiners report that they have examined the candidate viva voce on the subject of the thesis , and that they have satisfied themselves, (i) that he is acquainted with the literature on the subject (ii) that the thesis is genuinely the work of the candidate, and (iii) that the candidate evinces a capacity for critical examination and judgment.

Part III.—(The Examiners are to give here a

concise statement of the grounds on which the decision summarised under Part I or Part II is based).

Part IV.—The Examiners recommend :—

Strike out either (a) or (b).

(a) That the Degree of Doctor of Philosophy in the Faculty be conferred on the candidate.

(b) That the Degree of Doctor of Philosophy be not conferred on the candidate.

Strike out either (i) or (ii).

(c) (i) That the candidate be allowed to represent his thesis within six months from the date of the decision. The lines on which the Examiners recommend a revision of the thesis shall be communicated to the candidate.

(ii) That the candidate be allowed to re-appear at the viva voce examination within six months from the date of the decision.

Examiner of the thesis

Viva Voce Examiner.

E

Transitory Ordinance

Candidates whose applications for permission

to supplicate for the D. Litt. or D.Sc. degrees have already come before the Faculty shall be permitted to appear under the old Ordinances.

Ordinances of the Degree of Doctor of Letters

1. A candidate for the Degree of Doctor of Letters must be either.

- (i) (a) a Doctor of Philosophy of this University of at least two years' standing, or
- (b) a Master of Arts of this University of at least seven years' standing, or
- (ii) (c) a Master of Arts of at least seven years' standing of a University recognised by this University who has resided at the University for at least one year, or,
- (d) a Doctor of Philosophy of another University recognized by the Allahabad University who has resided at the University for at least one year.

Candidates under (b) and (c) must satisfy the Faculty that the work already done by them is of sufficient merit to earn exemption from the D. Phil. Degree.

2. Every candidate who intends to supplicate for the said degree shall communicate his intention

to do so to the Registrar stating the subject chosen by him for the thesis and support his application by submitting a copy of the contribution published by him towards the advancement of the subject of his study. He shall submit a certificate from two members of the Faculty that he is a fit and proper person to supplicate for the Degree of Doctor of Letters.

3. The application shall be placed before the Faculty of Arts which shall consider the suitability of the subject.

4. In case the Faculty approves of the subject it shall appoint from among the teachers of the University a person to advise the candidate.

5. On report from the adviser that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint not less than three and not more than five examiners, two of whom shall be appointed to conduct the viva voce examination.

6. After the thesis is completed, the candidate shall supply five printed or typed copies of his thesis. The thesis shall comply with the following conditions :—

The thesis submitted by the candidate must be entirely his own work and must be an original

contribution to knowledge characterised either by the discovery of new facts and their significance or by a new interpretation of facts or theories and in either case it should evince the capacity of the candidate for critical examination and judgment. It shall also be satisfactory so far as its literary presentation is concerned, and must be suitable for publication.

7. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject, but he shall not submit as his thesis any work for which a degree has already been conferred on him in this or any other University. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject.

8. The examiners shall examine the thesis and other published work of the candidate and shall submit their reports on the prescribed form either conjointly or separately. The examiners may consult one another before submitting their reports. They may make such suggestions as they deem fit for the improvement of the thesis. These suggestions shall be communicated to the examinee.

9. After the examiners have read the thesis they may recommend that the candidate be rejected or be allowed to represent the thesis in a revised

form not earlier than six months and not later than two years from the date of the decision of the Faculty.

10. If the majority of Examiners report that the thesis is satisfactory, the University shall arrange the viva voce examination.

11. If the viva voce Examiners are also satisfied, the recommendations shall be placed before the Faculty for necessary action.

12. The Faculty shall accept all unanimous recommendation, or recommendations made by a majority of the Examiners. In the event of no definite recommendations made by a majority of Examiners the Faculty may allow the candidate to re-present the thesis or may appoint one or more fresh Examiners to Examine the thesis.

13. In case the recommendation of the viva voce Examiners of the thesis differs from the recommendation of the Examiners of the thesis the candidate may be asked to re-appear for the viva voce Examination within six months. If the candidate fails to satisfy the viva voce Examiners a second time he shall be rejected.

14. No candidate shall be allowed to re-present his thesis more than once or to re-appear at the viva voce Examination more than once.

15. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D. Litt. Degree of the Allahabad University.

16. The following fees shall be charged :—

(a) A fee for guidance and supervision of work as laid down in Ordinance 19 (2) of Chapter XXVII.

(b) A fee of Rs 250 for the examination.

17. Each Examiner shall be paid a fee of Rs. 100 for reading the thesis and a fee of Rs. 100 for examining the candidate viva voce.

Note.—When an Examiner conducts the *viva voce* examination and is also one of the Examiners to assess the thesis he shall be paid only Rs. 150.

UNIVERSITY OF ALLAHABAD

FACULTY OF ARTS

Report of Examiners for D. Litt. Degree.

The Examiners report to the Faculty that student of Department has presented a thesis entitled for the degree of Doctor of Letters.

Part I.—(For the Examiners of the thesis only)

A.—The Examiners report after the examination of the thesis :—

- (i) that the thesis submitted by the candidate is an original contribution to knowledge characterised
- (a) by the discovery of new facts and their significance,
- or
- (b) by a new interpretation of facts or theories,
- and
- (ii) that the thesis evinces the candidate's capacity for critical examination and judgment, and
- (iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Letters in the University of Allahabad.

B.—After the Examination of the thesis, the Examiners recommend that the candidate be rejected without further test.

C.—After the Examination of thesis the Examiners recommend that the candidate be permitted to represent the thesis in a revised form.

Part II.—(For the Examiners of the viva voce Examination).

The Examiners report that they have examined the candidate viva voce on the subject of the thesis and on the subjects relevant thereto; and that they have satisfied themselves, (i) that the thesis is genuinely and entirely the work of the candidate, and (ii) that the candidate evinces the capacity for critical examination and judgment.

Part III.—(The Examiners are to give here a concise statement of the grounds on which the decision summarised under Part I or Part II is based).

Part IV.—Examiners recommend :—

Strike out either (a), (b) or (c).

- (a) that the Degree of Doctor of Letters in the Faculty be conferred on the candidate ;
- (b) that the lower Degree of Doctor of Philosophy be conferred on the candidate ;
- (c) that the Degree of Doctor of Letters be not conferred on the candidate.

Strike out either (i) or (ii)

- (i) that the candidate be allowed to represent his thesis within one year from the date of decision ;

- (ii) that the candidate be allowed to re-appear at the viva voce examination within one year from the date of the decision.

Chapter
XXXV

Examiner of the thesis

Viva Voce Examiner

F

Ordinances for the Degree of Master of Education

1. The examination for the Degree of Master of Education shall be open to a candidate who has after graduation passed the B. Ed, B. T., or L. T. Examination or an equivalent examination held by a Provincial Government or by any University in India recognised by the law or the place in which it is situated or of any University or body which the Academic Council may from time to time recognise for this purpose, and has pursued for one Session the prescribed course of study at the University.

2. The Course of study for the M. Ed. Examination shall be confined to *one* of the following groups :

Group A.—Advanced study in Education.

Group B.—Study and investigation in Experimental and Applied Education.

Group C.—Study and investigation in Educational Administration, Organisation and Survey.

Group D.—Such other advanced and specialised courses as may be prescribed from time to time.

3. The Examination in Group (A) *Advanced study in Education*, shall consist of Paper I Philosophy of Education (including the history and evolution of Educational Theories),

Paper II—Advanced Educational Psychology and Experimental Education,

Paper III—Comperative Education,

Paper IV—Psychology of Childhood and Adolescence (with emphasis on the mentally retarded and gifted),

Paper V and VI any two of the following :—

1. University Education,
2. Basic and Higher Secondary Education,
3. Pre-Basic Education,
4. Vocational Guidance and Selection,
5. Educational Sociology,
6. Mental Hygiene and Child Guidance,
7. Moral and Religious Education,
8. Problem of Indian Education.

Paper VII—Essay and *Viva Voce*.

4. Candidates shall be required to satisfy the Viva Board that as far as possible they have supple-

mented class lectures by field work or work in the Laboratory. Chapter XXXV

(Details of Courses for Groups B, C and D will be furnished later).

5. A candidate who has attended a regular course of study for one session in the University and has either failed to appear or failed to pass may be allowed at the M. Ed. Examination of any subsequent year without attending a further regular course of study.

6. A candidate for M. Ed. who satisfies the requirements of clause 1, of the Ordinances and who can produce evidence of capacity for research may, on the recommendation of the Head of the Department, be permitted to submit a thesis in lieu of the written examination. Such a candidate will be required to spend at least one year in research work.

7. Every candidate supplicating for the M. Ed. Degree by thesis will be required to present himself for viva voce.

8. The candidate shall select the subject of his thesis at the time of his admission to the M. Ed. Class, in consultation with the Head of the Department.

9. The candidate shall pursue his investigation at Allahabad under the supervision of the Head of the Department or of a member of the staff to whom the candidate may be assigned by the Head. If, however, it is in the interest of his investigation that the candidate should work elsewhere, the Vice-Chancellor may, on the recommendation of the Head of the Department, give him leave of absence not more than six months.

10. On the completion of his research work the candidate shall submit three printed or typed written copies of his thesis.

TRANSITARY ORDINANCES

11. Notwithstanding anything to the contrary, candidates who have passed the M. Ed. Previous examination in 1948 or prior to 1948, may be permitted to sit for the M. Ed. Final Examination in 1949 under the Ordinances in force for 1947-48. This Ordinance shall cease to be in operation after the Examination of 1949.

CHAPTER XXXVI

A

Ordinances for the Degree of Bachelor of Science (Pass)

1. The courses of study for the B.Sc. (Pass)

Section 32 (c). degree shall extend over a period of two academic years and the degree examination shall be held at the end of the second academic year.

2. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at the examination.

3. Every candidate shall be required to pass in either of the following groups of subjects :—

(a) Physics, Chemistry and Mathematics ;

(b) Chemistry, Botany and Zoology ;

(c) Geography, Botany and Zoology ;

(d) Physics, Mathematics and Military*
Science ;

(e) Mathematics, Chemistry and Military*
Science ;

(f) Chemistry, Military Science and Botany
or Zoology ;

(g) *Military Science, Botany and Zoology ;
provided that no student will be allowed to take
M.Sc. in Botany unless he has taken Chemistry in
B.Sc.; provided that no candidate shall be allowed
to take any subject, unless he has passed an exami-
nation in the corresponding subject in the Inter-

* Open only to the member of the U. T. C.

mediate, or any other examination recognised as qualifying for admission to a degree course.

4. A candidate may, at his option, take Compulsory English as an extra subject.

The marks obtained by the candidate shall not be counted towards his aggregate, and the class obtained by him in Compulsory English shall be indicated in his diploma and notified in the Gazette.

5. Students who are reading for a Pass degree may, on the recommendation of the Head of the Department concerned, be transferred by the Dean to the Honours course at any time within the first three months of the first year of study.

Regulations

1. The examination for the degree of Bachelor of Science shall be by means of papers; but candidates shall be required to undergo a practical examination, except in the case of Mathematics, examination in which shall be entirely by means of papers.

Candidates shall be required to pass separately in the practical examinations.

2. Names of successful candidates shall be arranged in three classes. Candidates who obtain 60 per cent. and upwards of the aggregate marks shall be placed in the first class. Candidates who obtain 48 per cent. or more, but less than 60 per cent. of the aggregate marks, shall be placed in the second class. Candidates who obtain 33 per cent. or more but less than 48 per cent. of the aggregate marks, shall be declared to have passed in the third class. Names shall be arranged in alphabetical order within the classes.

3. Candidates must obtain at least 33 per cent. of the total marks in each subject.

4. The examination in Compulsory English shall be the same as for the B.A. degree.

B

Ordinances for the Degree of Bachelor of Science (Honours)*

1. The courses of study for the B. Sc. (Honours) Degree shall extend over a period of three academic years.

2. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at the examination.

3. There shall be the following Honours Schools in the Faculty :—

(1) Physics, (2) Chemistry, (3) Botany,
(4) Zoology, (5) Mathematics.

4. Every candidate for the degree of B.Sc. Honours shall, in addition to his Honours or principal subject, be required to pass an examination in each of two subsidiary subjects.

5. The subsidiary subjects, which may be taken along with a particular principal subject, will be determined by the Dean in consultation with the Heads of Departments concerned.

* The Honours courses are in abeyance.

Chapter
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2. Candidates who pass the Examination for B. Sc. Honours shall be classified in three classes :—

1st class : 60 per cent. of the total marks in the Honours subject.

2nd class : 48 per cent. of the total marks in the Honours subject.

3rd class : 36 per cent. or more, but less than 48 per cent. of the total marks in the Honours subject.

Candidates obtaining 33 per cent. or more but less than 36 per cent. of the total marks in Theory and Practical separately in the Honours subject may be awarded a Pass degree.

3. The names of successful candidates shall be published in such form as to distinguish the Honours Schools in which they have passed ; the names shall be arranged in order of merit within the classes.

C

Ordinances for the Pass Degree of Bachelor of Science (Home Sciences) for women candidates only.

(Home Sciences)

1. Courses of Study for the Degree of Bachelor of Home Sciences shall extend over a period of two academic years and the degree examination shall be held at the end of the second academic year.

2. Girls who pass the Intermediate Examination of the U. P., Board or an equivalent examination

recognised by the University, offering Science either at the High School or at the Intermediate Examination, shall be eligible for admission to this course. Chapter XXXVI

3. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at the examination.

4. Every candidate shall be required to pass in the following group of subjects:—

(i) Science—Four papers.

Paper I—Human Physiology, Nutrition and Dietetics and Practical.

Paper II—Bacteriology and Hygiene and Practical.

Paper III—Chemistry and Practical.

Paper IV—Bio-Chemistry and Practical.

(ii) Sociology.

Paper I—Home Economics.

Or

Paper II—Psychology with special reference to Child Psychology or Ethics.

(iii) Household Arts.

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GROUP A

Two Papers.

Paper I—Principles of Arts and Design and
ractical.

Paper II—(a) Textiles, or (b) Cookery and
Practical.

Or

GROUP B

Music

Paper I—Theory.

Practical.

Or

GROUP C

Painting

Paper I—Theory.

Practical.

5. A candidate, at her option, may take Compulsory English as an extra subject. The marks obtained by the candidate shall not be counted towards her aggregate and the class obtained by her in Compulsory English shall be indicated in her diploma and notified in the Gazette.

Regulations

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1. The examination for the degree of Bachelor of Home Sciences shall be by means of Papers; but candidates shall be required to undergo a practical examination where specifically provided.

Candidates shall be required to pass separately in the practical examination.

2. The names of the successful candidates shall be arranged in three classes. Candidates who obtain 60% of the aggregate marks or above shall be placed in the first class. Candidates who obtain 48% or more, but less than 60% of the aggregate marks, shall be placed in the second class. Candidates who obtain 33% or more, but less than 48% of the aggregate marks shall be declared to have passed in the third class. The names shall be arranged in alphabetical order within the classes.

3. Candidates must obtain at least 33 per cent. of the total marks in each subject.

4. The examination in Compulsory English shall be the same as for the B.A. degree.

MARKS ASSIGNED

Marks. Minimum
pass marks.

I. Science

Paper I—Human Physiology, Nutrition, and Dietetics ..	50	} 33
Paper II—Bacteriology and Hygiene	50	

Chapter XXXVI	Paper III—Chemistry	..	50	}	33
	Paper IV—Bio-Chemistry	..	50		
	Practical—Papers I and II	..	50		17
	Papers III and IV	..	50		17

II. Sociology

Paper I—Home Economics	..	100	33
------------------------	----	-----	----

Or

Paper II—Child Psychology	or		
Ethics ..	..	100	33

III. Household Arts

GROUP A

Paper I—Arts and Design

Theory	25	}	17
Practical	25		

Paper II—Textiles

Theory	50	}	50
Practical	100		

Or

Cookery

Theory	50	}	50
Practical	100		

Or

GROUP B

Music

Paper I—Theory	.. 50	17
Practical	.. 150	50

Or

GROUP C

Painting

Paper I—Theory	.. 50	17
Practical	.. 150	50

Candidates will be required to pass separately in Theory and Practical test except in Group A.

D

Ordinances for the Degree of Master of Science

1. A candidate who after taking the Pass degree in Science or in Agriculture has completed a regular course of study in the University, shall be admitted to the Previous Examination for the degree of Master of Science at the end of the academical year in which he has completed such course of study ; but if he does not then appear at

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the examination, he cannot be admitted to a subsequent examination in the same subject, unless during the academical year at the end of which such Examination is held, he has completed a regular course of study in the University for the Examination. Provided that no candidate shall be allowed to take any subject for the M.Sc. examination unless he has passed an examination in the corresponding subject in the B.Sc.

2. A candidate who, after passing the Honours B.Sc. Examination or the Previous M.Sc. Examination, has completed a regular course of study in the University, shall be admitted to the Examination for the degree of Master of Science at the end of the academical year in which he has completed such course of study ; but if he does not then appear at the examination, he cannot be admitted to a subsequent examination in the same subject, unless, during the academical year at the end of which such examination is held, he has completed a further regular course of study for the examination.

3. Where a candidate submits a thesis for the M.Sc. degree in place of one or more papers an extra copy of the said thesis shall be submitted by him to the Registrar to be deposited in the University Library.

E

Chapter
XXXVI**Ordinances for the Degree of Doctor of
Philosophy**

1. A candidate for the Degree of Doctor of Philosophy must be either :—

- (i) A Master of Arts or Science of this University ; or
- (ii) A Master of Arts or Science of any other University recognised by this University.

2. The candidate shall apply for admission to the University stating his qualifications and the subject he proposes to investigate, and enclosing a statement of any work he may have done in the subject.

3. The application shall be placed before a Research Degree Committee consisting of the Vice-Chancellor, the Dean, and the Head or Heads of Departments concerned; they shall have power to co-opt two other members. This Committee shall satisfy itself that the subject offered is one which can be profitably pursued under the superintendence of the University and that the candidate

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possesses the requisite qualifications and equipment. If the Committee is satisfied on these points, it shall grant the application for admission and appoint a member of the teaching staff to guide the work of the candidate. The proceedings of the Committee shall be reported to the Faculty at its next meeting.

4. Every candidate shall pursue as a student of the University a course of research of not less than 20 months duration.

Note.—A teacher of this University shall be considered to be a student for the purpose of this Ordinance.

5. He shall pursue his research at Allahabad unless the Vice-Chancellor, on the recommendation of the supervisor, gives him leave of absence for ordinarily not more than one year on the ground that it is in the interest of his research that he should work elsewhere.

6. A candidate may, not later than one year after his admission, modify the scheme of his subject with the approval of the Committee.

7. Candidates for the D. Phil. Degree shall ordinarily be required to submit their theses within three years of their admission as D. Phil. Scholars but in special cases, it would be open to the Vice-

Chancellor to extend the period on the recommendation of the Supervisor concerned.

8. On a report from the Supervisor that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint three Examiners, two of whom shall conduct the viva voce examination if necessary. The Supervisor shall ordinarily be one of the Examiners.

9. After the thesis is completed the candidate shall supply five printed or typed copies of his thesis which shall comply with the following conditions :—

It must be a piece of research work characterised either by the discovery of facts or by a fresh approach towards interpretation of facts or theories ; in either case it should evince the candidate's capacity for critical examination and judgment. It shall also be satisfactory so far as its literary representation is concerned, and must be suitable for publication.

No candidate will be permitted to proceed to any research degree unless and until he has paid all dues as a student.

10. The candidate shall indicate how far the thesis embodies the result of his own research or observations and in what respects his investiga-

tions appear to him to advance the study of his subject.

11. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject which he may have published independently or conjointly. In the event of his submitting such subsidiary matter he shall be required to state fully his own share in any conjoint work.

12. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject but he shall not submit as his thesis any work for which a degree has been conferred on him in this or any other University.

13. The examiners shall examine the thesis and shall submit their reports on the prescribed form either conjointly or separately. The examiners may consult one another before formulating their reports. They may make such suggestions they deem fit for the improvement of the thesis.

14. After the examiners have read the thesis, they may recommend that the thesis be rejected, or that the candidate be allowed to re-present his thesis in a revised form not earlier than six months and not later than two years from the date of the decision of the Faculty.

15. If the majority of the examiners report that the thesis is satisfactory, the University shall arrange for the viva voce examination if so directed by one or more of the examiners.

16. If the viva voce examiners are also satisfied the recommendations of the thesis and viva voce examiners shall be placed by the Research Degree Committee before the Faculty for necessary action.

17. The Faculty shall accept all unanimous recommendation or recommendations made by a majority of the examiners. In the event of no definite recommendations being made by a majority of examiners the Faculty may allow the candidate to re-present the thesis or may appoint one or more fresh Examiners to examine the thesis.

18. In case the recommendation of the viva voce examiners differs from the recommendation of the Examiners of the thesis the candidate may be asked to re-appear at the viva voce examination within one year. If the candidate fails to satisfy the viva voce Examiners a second time, he shall be rejected.

19. No candidate shall be allowed to re-present his thesis more than once or to re-appear at the viva voce examination more than once.

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20. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D. Phil. Degree of the Allahabad University.

21. The following fees shall be charged :—

a) A fee for guidance and supervision of work as laid down in Ordinance 19 (2) of Chapter XXVII.

(b) A fee of Rs. 150 for the examination.

22. Each examiner shall be paid a fee of Rs. 50 for reading the thesis and a fee of Rs. 50 for examining the candidate viva voce.

Note.—When an examiner conducts the *viva voce* examination and is also one of the examiners to assess the thesis he shall be paid only Rs. 75.

23. The Faculty may exempt a candidate from the conditions laid down in Ordinance 4, provided that he had carried on research at this University prior to the coming into force of these Ordinances.

UNIVERSITY OF ALLAHABAD

FACULTY OF SCIENCE

Report of Examiners for D. Phil. Degree.

The examiners report thatstudent of....
Department has presented a thesis entitled....for

the Degree of Doctor of Philosophy.

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Part I.—(For the examiners of the thesis only).

A.—The Examiners report after the examination of the thesis—

(i) that the thesis submitted by the candidate is a piece of research work characterised

(a) by the discovery of facts ;

or

(b) by a fresh approach towards interpretation of facts or theories ;

and

(ii) that the thesis evinces the candidate's capacity for critical examination and judgment,

and

(iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Philosophy in the University of Allahabad.

B.—After the examination of the thesis, the

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examiners recommend that the candidate be rejected without further test.

C.—After the examination of the thesis, the examiners recommend that the candidate be permitted to re-present the thesis in a revised form.

Part II.—(For the examiners of the *viva voce* Examination).

The examiners report that they have examined the candidate *viva voce* on the subject of the thesis and that they have satisfied themselves, (i) that he is acquainted with the literature on the subject (ii) that the thesis is genuinely the work of the candidate, and (iii) that the candidate evinces a capacity for critical examination and judgment.

Part III.—(The examiners are to give here a concise statement of the grounds on which the decision summarised under Part I or Part II is based).

Part IV.—The examiners recommend --

Strike out either (a) or (b)

(a) that the Degree of Doctor of Philosophy in the Faculty be conferred on the candidate.

- (b) that the Degree of Doctor of Philosophy be not conferred on the candidate. Chapter XXXVI

Strike out either (i) or (ii)

- (c) (i) that the candidate be allowed to represent his thesis within six months from the date of the decision. The lines on which the Examiners recommend a revision of the thesis shall be communicated to the candidate.

- (ii) that the candidate be allowed to re-appear at the viva voce examination within six months from the date of the decision.

Examiner of the thesis
Viva Voce Examiner

F

TRANSITORY ORDINANCE

Candidates whose applications for permission to supplicate for the D.Litt or D.Sc. degrees have already come before the Faculty shall be permitted to appear under the old Ordinances.

Ordinances for the Degree of Doctor of Science

1. A candidate for the Degree of Doctor of Science must be either.

(i) (a) a Doctor of Philosophy of this University of at least two years' standing or

(b) a Master of Arts or a Master of Science of this University of at least seven years' standing

or

(ii) (c) a Master of Arts or a Master of Science of at least seven years' standing of a University recognised by this University who has resided at the University for at least one year, or

(d) a Doctor of Philosophy of another University recognised by the Allahabad University who has resided at the University for at least one year.

Candidates under (b) and (c) must satisfy the Faculty that the work already done by them is of sufficient merit to earn exemption from the D.Phil. Degree.

No candidate will be permitted to proceed to any research degree unless and until he has paid all dues as a student.

2. Every candidate who intends to supplicate for the said degree shall communicate his intention to do so to the Registrar stating the subject chosen by him for the thesis and support his application by submitting a copy of the contribution published by him towards the advancement of the subject of his study. He shall submit a certificate from two members of the Faculty that he is fit and proper person to supplicate for the Degree of Doctor of Science.

3. The application shall be placed before the Faculty of Science which shall consider the suitability of the subject.

4. In case the Faculty approves of the subject it shall appoint from among the teachers of the University a person to advise the candidate.

5. On a report from the adviser that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint not less than three and not more than five Examiners, two of whom shall be appointed to conduct the *viva voce* examination.

6. After the thesis is completed, the candidate shall supply five printed or typed copies of his thesis. The thesis shall comply with the following conditions :—

The thesis submitted by the candidate must be entirely his own work and must be an original contribution to knowledge characterised either by the discovery of new facts and their significance or by a new interpretation of facts or the theories, and in either case it should evince the capacity of the candidate for critical examination and judgment. It shall also be satisfactory so far as its literary presentation is concerned, and must be suitable for publication.

7. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject, but he shall not submit as his thesis any work for which a degree has already been conferred on him in this or any other University. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject.

8 The Examiners shall examine the thesis and other published work of the candidate and shall submit their reports on the prescribed form either conjointly or separately. The Examiners may consult one another before submitting their reports. They may make such suggestions as they deem fit for the improvement of the thesis. These suggestions shall be communicated to the examinee.

9. After the Examiners have read the thesis they may recommend that the candidate be rejected or be allowed to re-present the thesis in a revised form not earlier than six months and not later than two years from the date of the decision of the Faculty.

10. If the majority of Examiners report that the thesis is satisfactory, the University shall arrange the viva voce Examination.

11. If the viva voce Examiners are also satisfied, the recommendation shall be placed before the Faculty for necessary action.

12. The Faculty shall accept all unanimous recommendation or recommendations made by a majority of the Examiners. In the event of no definite recommendations made by a majority of Examiners the Faculty may allow the candidate to re-present the thesis or may appoint one or more fresh Examiners to examine the thesis.

13. In case the recommendation of the viva voce Examiner of the thesis differs from the recommendation of the Examiners of the thesis the candidate may be asked to re-appear for the viva voce examination within six months. If the candidate fails to satisfy the viva voce examiners a second time, he shall be rejected.

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14. No candidate shall be allowed to represent his thesis more than once or to re-appear at the viva voce examination more than once.

15. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D.Sc. degree of the Allahabad University.

16. The following fees shall be charged :—

(a) A fee for guidance and supervision of work as laid down in Ordinance 19(2) of Chapter XXVII.

(b) A fee of Rs. 250 for the examination.

17. Each examiner shall be paid a fee of Rs. 100 for reading the thesis and a fee of Rs. 100 for examining the candidate viva voce.

Note.—When an examiner conducts the *viva voce* examination and is also one of the examiners to assess the thesis he shall be paid only Rs. 150.

UNIVERSITY OF ALLAHABAD

FACULTY OF SCIENCE

Report of Examiners for D.Sc. Degree.

The examiners report to the Faculty that : . . .
student of . . . Department has presented a

thesis entitled for the Degree of Doctor of Science.

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Part I.—(for the examiners of the thesis only).

A.—The Examiners report after the examination of the thesis—

(i) that the thesis submitted by the candidate is an original contribution to knowledge characterised

(a) by the discovery of new facts and their significance

or

(b) by a new interpretation of facts or theories ;

and

ii) that the thesis evinces the candidate's capacity for critical examination and judgment,

and

(iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Science in the University of Allahabad.

B.—After the examination of the thesis, the examiners recommend that the candidate be rejected without further test.

C.—After the Examination of the thesis, the Examiners recommend that the candidate be permitted to re-present the thesis in a revised form.

Part II—(For the Examiners of the viva voce examination).

The Examiners report that they have examined the candidate viva voce on the subject of the thesis and on the subjects relevant thereto, and that they have satisfied themselves (i) that the thesis is genuinely and entirely the work of the candidate and (ii) that the candidate evinces the capacity for critical examination and judgment.

Part III—(The examiners are to give here a concise statement of the grounds on which the decision summarised under Part I or Part II is based).

Part IV—The Examiners recommend—

Strike out either (a), (b) or (c)—

- (a) that the Degree of Doctor of Science in the Faculty be conferred on the candidate ;

(b) that the lower degree of Doctor of Philosophy be conferred on the candidate ;

(c) that the Degree of Doctor of Science be not conferred on the candidate.

Strike out either (i) or (ii) —

(d) (i) that the candidate be allowed to re-present his thesis within one year from the date of the decision ;

(ii) that the candidate be allowed to reappear at the vive voce examination within one year from the date of the decision.

Examiner of the thesis
Viva Voce Examiner

G

Ordinances for the Degree of Bachelor of Science (Pass) in Agriculture

1. The examination for the degree of Bachelor of Science in Agriculture shall be open to any candidate who has passed the Intermediate Examination in Agriculture of the Board of High School and Intermediate Education, U. P., or an other exa

mination* in Agriculture recognised by the University as equivalent thereto.

2. The courses of study for the B.Sc. (Ag.) Pass degree shall extend over a period of two academic years and the degree examination shall be held at the end of the second academic year.

3. A candidate who has attended a regular course of study in the University for this degree shall be permitted to appear at the examination.

4. Every candidate shall be required to pass in the following subjects :—

1. Agricultural Economics, Agricultural Engineering, Agricultural Chemistry and Farm Sciences.

2. Biological Sciences, and

3. Any one of the following subjects :—

(a) Agronomy.

* Examination recognized :—

(i) The Intermediate Examination in Agriculture of the Nagpur University (*vide* Ac. C. Res., No. 15, dated 8-3-1935) ;

(ii) The First Examination in Agriculture of the Punjab University (*vide* Ac. C. Res., No. 12, dated 4-3-1938).

(b) Pomology.

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(c) Animal Husbandry and Dairying

N. B.—Candidates offering subjects mentioned in 1, 2 and 3 (c) will be exempted from Paper II (Entomology and Practical Examination in Entomology.)

Regulations

1. The examination for the Degree of Bachelor of Science in Agriculture shall be by means of Papers, but candidates shall be required to undergo a practical examination in each subject.

Candidates shall be required to pass separately in the written as well as in the practical examination of each subject.

2. The names of successful candidates shall be arranged in three classes :—

1st class : 60 per cent. or more of the aggregate marks.

2nd class : 48 per cent. or more but less than 60 per cent. of the aggregate marks.

3rd class : 33 per cent. or more but less than 48 per cent. of the aggregate marks.

3. In order to pass candidates shall be required to obtain at least 25 per cent. marks in each paper and 33 per cent. in each practical and 33 per cent. marks in the aggregate of each group of subjects.

H

**Ordinances for the Degree of Bachelor
of Science (Pass) in Agricultural
Engineering**

1. The examination for the degree of Bachelor of Science in Agricultural Engineering shall be open to any candidate who has passed the Intermediate examination in Agriculture of the Board of High School and Intermediate Education, United Provinces, or any other examination in Agriculture, recognized by the University as equivalent thereto.
2. The courses of study for the B. Sc. (Agr. Engineering) Pass degree shall extend over a period of two academic years and the degree examination shall be held at the end of the second academic year.
3. A candidate who has attended a regular course of Study in the University for this degree shall be permitted to appear at the examination.
4. Every candidate shall be required to pass in the following subjects :—
 - (1) Advanced Shop Work, Engineering Drawing and Structural Design, Agricultural Structures.
 2. Materials of Construction and Strength of Materials, Mechanics and Statics,

Agricultural Machinery, Principles of
Electric Machinery.

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- (3. Farm Management, Soil and Water
Conservation including Surveying,
Machine Design.

Regulations

1. The examination for the Degree of Bachelor of Science in Agriculture Engineering shall be by means of papers, and the practical tests as prescribed in the syllabus.

Candidates shall be required to pass separately in the written as well as in the practical examination in each subject.

2. The names of successful candidates shall be arranged in three classes :—

First class : 60 per cent. or more of the aggregate marks

Second class : 48 per cent. or more, but less than 60 per cent. of the aggregate marks.

Third class : 33 per cent. or more but less than 48 per cent. of the aggregate marks.

3. In order to pass candidate shall be required to obtain at least 25 per cent. marks in each paper and 33 per cent. each practical and 33 per cent. marks in the aggregate of each group of subjects.

CHAPTER XXXVII

A

Ordinances for the Degree of Bachelor of Laws

1. A candidate who after graduating either

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Section 32 (c).

in Arts, in Science or in Commerce completes a regular course of study in the University, for one academical year, shall be admitted to the Previous Examination in Law.

Note.— Graduates in Agriculture are also eligible for admission to the Law classes.

2. A candidate who after passing the previous examination has completed a regular course of study in the University for one academical year, shall be admitted to the examination for the degree of Bachelor of Laws.

3. (a) Notwithstanding anything contained in the foregoing ordinances a candidate shall not be admitted after 1931 to either the Previous or Final Examination for the degree of Bachelor of Laws unless he has attended a regular course of study for that examination within ten years immediately preceding the examination

(b) In and after the year 1931 no candidate shall be admitted to either the Previous or Final Examination for the degree of Bachelor of Laws except a candidate who has attended lectures either in the University School of Law prior to 1923 or in the Law Department of the University.

4. The Examination for the degree of Bachelor of Laws shall consist of two parts—(1) the Previous Examination and (2) the Final Examination. Chapter
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5. Every candidate for the Previous Examination shall present himself for examination in the following subjects :—

- (i) Roman Law ;
- (ii) The Law of Contracts, except the Law of Partnership ;
- (iii) The Law of Easements and Torts ;
- (iv) The Law of Evidence ;
- (v) Criminal Law and Procedure ;
- (vi) Constitutional Law and Administrative Law ;
- (vii) Hindu Law with the statutory modifications thereof ;

and the examination shall be conducted by papers.

6. Every candidate for the examination for the degree of Bachelor of Laws shall present himself for examination in the following subjects :—

- (i) Civil Procedure including Principles of Pleading and Limitation ;
- (ii) The Law relating to Land Tenures, Rent

and Revenue in the United Provinces of Agra and Oudh ;

- (iii) The Law of Partnership and of Companies ;
- (iv) Muhammadan Law, with the statutory modifications thereof ;
- (v) The Law relating to Transfer of Property including the Principles of Equity in so far as they relate to the subject ;
- (vi) Equity with special reference to the Law of Trusts and Specific Relief ;
- (vii) Jurisprudence and the latest theories in Jurisprudence, such as those of Leon Duguit ;
- (viii) Public International Law ;

and the examination shall be conducted by papers.

7. The list of candidates who have passed, either in the Previous or in the LL.B., Examination, shall be arranged in two classes. A candidate who, out of the aggregate marks obtainable, obtains not less than 60 per cent. shall be placed in the first class, and a candidate who obtains not less than 50 per cent. shall be placed in the second class provided that no candidate shall be placed in either

class, who does not succeed in obtaining a minimum of 30 per cent. of the marks allotted to each paper. Chapter
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B

Ordinances for the Degree of Master of Laws

1. No candidate shall be admitted to the examination for the degree of LL.M. unless he has passed, not less than two academical years previously, the examination for the degree of Bachelor of Laws of the Allahabad University, or the degree of Bachelor of Laws of any other University to which Ordinance 5 of Chapter XXXIV applies, and has for one academical year (1) pursued an approved course of study at the Allahabad University and (2) worked in the University Library under the guidance and supervision of the University Staff.

FEE

Each candidate shall pay the fee prescribed for graduates and advanced students in Ordinance 19 (2) Chapter XXVII.

Transitory Ordinance

Candidates who have failed at the LL.M. Examination of the Allahabad University prior to the amendment of this Ordinance and who wish

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to appear at the examination in a subsequent year shall be required for a period of three months before the examination (1) to pursue an approved course of study at the University, and (2) to work in the University Library under the supervision of the University staff.

2. Candidates for the degree of Master of Laws shall be examined in the following compulsory Subjects with such combination of two of the Optional Subjects as an intending candidate adopts :—

COMPULSORY SUBJECTS

- I. Jurisprudence and Principles of Legislation.
- II. Constitutional Law, British and Indian.
- III. Equity.
- IV. Either (a) Hindu Law or b) Muhammadan Law.

OPTIONAL SUBJECTS

Only two out of these may be taken :—

- I. Muhammadan or Hindu Law, whichever is not chosen as a compulsory subject.
- II. The Law of Contracts.
- III. Transfer of Immovable Property and Easements.

IV. Roman Law.

V. International Law, Public.

VI. International Law, Private.

3. Candidates who obtain not less than 40 per cent. of the marks assigned to each subject and not less than 60 per cent. on the whole shall be declared to have passed the examination in the First Class.

Candidates who obtain not less than 40 per cent. of marks assigned to each subject and not less than 50 per cent. on the whole shall be declared to have passed the examination in the Second Class.

4. The names of successful candidates shall be arranged in alphabetical order.

5. The examination shall be conducted viva voce and by written papers. One hundred marks will be allotted for viva voce examination which examination will cover all the subjects selected by the candidate and will be conducted by 3 examiners resident in India of whom one will be from the Teaching Staff of the University, and the other two external examiners.

6. Failure to pass the examination will not operate as a disqualification to appear a second time upon a new application being forwarded and a fresh fee paid.

C

Ordinances for the Degree of Doctor of Laws

1. No special examination shall be held, but any person who has obtained the degree of Master of Laws of the University of Allahabad or has passed the examination for Honours in Law of the University of Allahabad on or before November 1st, 1906, may be admitted to the degree of Doctor of Laws without examination, provided—

- (a) that two members of the Faculty of Law or two Doctor of Laws certify to the satisfaction of the Academic Council that since obtaining the degree of Master of Laws or since passing the examination for Honours in Law under the regulations in force on or before November 1st, 1905, he has practised his profession with repute for at least five years or has contributed during such period either by scholastic work or by literary production to the advancement of law for the public benefit and that in habits and character, he is a fit and proper person for the degree of Doctor of Laws ; and

(b) that he has written an essay approved ^{Chapter} XXXVII
by the Faculty of Law, or by a sub-
committee thereof on some subject
connected with Law or with Juris-
prudence.

2. A candidate shall be required to state in a preface the source or sources whence he has derived information in the composition of his thesis, the extent to which he has availed himself of the work of others, and the portions of the thesis which he claims as original.

CHAPTER XXXVIII

A

Ordinances for the Degree of Bachelor of Commerce

1. The examination for the degree of Bachelor of Commerce shall be open to all students who have passed any of the following examinations and have since passing such examination prosecuted a regular course of study as laid down under these Ordinances at the University :—

(i) The Commercial Diploma Examination of the Allahabad University ; or the Commercial Diploma Examination of the Board of High School and Inter-

mediate Education, United Provinces ;
or the Intermediate Examination in
Commerce of the Board of High
School and Intermediate Education,
United Provinces ;

(ii) The Intermediate Examination in Com-
merce of the Nagpur, Travancore ,
Banaras and Aligarh Universities ;

(iii) The Bachelor of Arts Examination with
Economics ;

(iv) Master of Arts (Previous) Examination
in Economics of the Allahabad Uni-
versity ;

(v) Master of Arts * Examination of any
University ;

† (vi) The Intermediate Examination in Arts

• Students who have passed their M.A. Examination in Economics may be excused from examination in those subject-matters which in the opinion of the Head of the Department have already been covered in their M.A. work, and they may be permitted to appear in the remaining subjects of both Parts I and II in a single year, provided the time-table can be arranged so that they can attend the classes in the subjects of both parts which they have not studied.

† *Vide* Academic Council Res. No. 17, dated 8-3-1935.

and Science of the Andhra University with Banking, Accountancy and Commercial Geography ;

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(vii) The Intermediate Examination with Economics ;

and

‡(viii) The Final Examination for the full course certificate of the Government Commercial Institute, Calcutta, after having passed the Matriculation or any equivalent examination of any University or Board established by law in India.

Note.—As the First Year B. Com. Class has been abolished students who have passed the Intermediate Examination without Economics cannot be admitted to the B. Com. class.

2. The examination for the Degree of Bachelor of Commerce shall ordinarily be taken in two parts, i.e., Part I at the end of the First Year and Part II at the end of the Second Year or it may be taken entirely at the end of the Second Year in case of students who are unable to appear at the examination on account of illness supported by a Medical Certificate, provided they have passed in

‡ *Vide* Academic Council Res. No. 304, dated 15-11-1938.

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the tests previous to the examination and further provided the Head of the Department is satisfied. A candidate who has not passed Part I at the end of the First Year shall be eligible to appear in the entire examination for the Degree at the end of the Second Year.

3. A candidate who has passed the B. Com. Examination of the University may be permitted to appear in any subsequent year in an optional subject other than the one offered by him for B. Com. Part II Examination provided that the candidate has attended a regular course of study for one academical year in the subject. On passing the examination the candidate will be granted a certificate.

B

Ordinances for the Degree of Master of Arts in Economics

1. A candidate who after taking his degree either in the Faculty of Arts or in the Faculty of Commerce or in the Faculty of Science of this University or in the Faculty of Commerce of the Lucknow University or the Patna University has completed a regular course of study in the University for one academical year, shall be admitted to the Previous Examination for the degree of Master

of Arts in Economics ; provided (a) in the case of a candidate taking his degree without Economics in the Faculty of Arts ; and (b) in the case of a candidate taking his degree in the Faculty of Science, he satisfies the Head of the Department of Economics and the Dean of the Faculty of Commerce of his special fitness for admission to the course.

2. A graduate in Arts of any other University to which Ordinance 5 of the general Ordinances applies, who wishes to proceed to the degree of M.A. in Economics of this University may be admitted to the course and Examination mentioned in Clause I of this ordinance, provided that he shall have satisfied the Head of the Department of Economics and the Dean of the Faculty of Commerce of his special fitness for admission to the course.

3. A candidate, who after passing either the M.A. Previous Examination in Economics or the Bachelor of Arts Honours Examination in Economics, has completed a regular course of study for one academical year in the University, shall be admitted to the Final Examination for the degree of Master of Arts in Economics.

4. The Examination for the degree of Master of Arts in Economics shall consist of two parts—the Previous Examination, (2) the Final Examination. The Bachelor of Arts (Honours) Exa-

mination in Economics shall be equivalent to the Previous Examination in Economics.

C

TRANSITORY ORDINANCE

The students who were admitted as research students prior to the coming into effect of these Ordinances will be allowed to count this period of residence towards the minimum of attendance required in Ordinance 4.

Ordinances for the Degree of Doctor of Philosophy

1. A candidate for the Degree of Doctor of Philosophy must be either—

- (i) A Master of Arts of this University ; or
- (ii) A Master of Arts of any other University recognised by this University.
- (iii) A Master of Commerce of this University.

2. The candidate shall apply for admission to the University stating his qualifications and the subject he proposes to investigate, and enclosing a statement of any work he may have done in the subject.

3. The application shall be placed before a Research Degree Committee consisting of the Vice-Chancellor, the Dean, and the Head or Heads of Departments concerned; they shall have power to co-opt two other members. This Committee shall satisfy itself that the subject offered is one which can be profitably pursued under the superintendence of the University and that the candidate possesses the requisite qualifications and equipment. If the Committee is satisfied on these points, it shall grant the application for admission and appoint a member of the teaching staff to guide the work of the candidate. The proceedings of the Committee shall be reported to the Faculty at its next meeting.

4. Every candidate shall pursue as a student of the University a course of research of not less than 20 months' duration.

Note.—A teacher of this University shall be considered to be a student for the purpose of this Ordinance.

5. He shall pursue his research at Allahabad unless the Vice-Chancellor, on the recommendation of the supervisor, gives him leave of absence for ordinarily not more than one year on the ground that it is in the interest of his research that he should work elsewhere.

6. A candidate may, not later than one year

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after his admission, modify the scheme of his subject with the approval of the Committee.

7. Candidates for the D.Phil. degree shall ordinarily be required to submit their thesis within three years of their admission as D.Phil. Scholars, but in special cases, it would be open to the Vice-Chancellor to extend the period on the recommendation of the Supervisor concerned.

8. On a report from the supervisor that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint three examiners, two of whom shall conduct the viva voce examination, if necessary. The supervisor shall ordinarily be one of the examiners.

9. After the thesis is completed the candidate shall supply five printed or typed copies of his thesis which shall comply with the following conditions :—

It must be a piece of research work characterised either by the discovery of facts, or by a fresh approach towards interpretation of facts or theories ; in either case it should evince the candidate's capacity for critical examination and judgment. It shall also be satisfactory so far as its literary presentation is concerned, and must be suitable for publication.

10. The candidate shall indicate how far the thesis embodies the result of his own research

or observations and in what respect his investigation appears to him to advance the study of his subject. Chapter
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11. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject which he may have published independently or conjointly. In the event of his submitting such subsidiary matter he shall be required to state fully his own share in any conjoint work.

12. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject but he shall not submit as his thesis any work for which a degree has been conferred on him in this or any other University.

13. The examiners shall examine the thesis and shall submit their reports on the prescribed form either conjointly or separately. The examiners may consult one another before formulating their reports. They may make such suggestions as they deem fit for the improvement of the thesis.

14. After the examiners have read the thesis they may recommend that the thesis be rejected, or that the candidate be allowed to re-present his thesis in a revised form not earlier than six

months and not later than two years from the date of the decision of the Faculty.

15. If the majority of examiners report that the thesis is satisfactory, the University shall arrange for the viva voce examination, if so directed by one or more of the examiners.

16. If the viva voce examiners are also satisfied, the recommendations of the thesis and viva voce examiners shall be placed by the Research Degree Committee before the Faculty for necessary action.

17. The Faculty shall accept all unanimous recommendation or recommendations made by a majority of the examiners. In the event of no definite recommendations being made by a majority of examiners the Faculty may allow the candidate to re-present the thesis or may appoint one or more fresh examiners to examine the thesis.

18. In case the recommendation of the viva voce examiners differs from the recommendation of the examiners of the thesis the candidate may be asked to re-appear at the viva voce examination within one year. If the candidate fails to satisfy the viva voce examiners a second time, he shall be rejected.

19. No candidate shall be allowed to re-present his thesis more than once or to re-appear at the viva voce examination more than once. Chapter XXXVIII

20. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D.Phil. Degree of the Allahabad University.

21. The following fees shall be charged :

(a) A fee for guidance and supervision of work as laid down in Ordinance 19(2) of Chapter XXVII.

(b) A fee of Rs. 150 for the examination.

22. Each examiner shall be paid a fee of Rs. 50 for reading the thesis and a fee of Rs. 50 for examining the candidate viva voce.

Note.—When an examiner conducts the *viva voce* examination and is also one of the examiners to assess the thesis he shall be paid only Rs. 75.

23. The Faculty may exempt a candidate from the conditions laid down in Ordinance 4, provided that he had carried on research at this University prior to the coming into force of these ordinances.

UNIVERSITY OF ALLAHABAD

FACULTY OF COMMERCE

Report of Examiners for D. Phil. Degree

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The examiners report that....student of....
Department has presented a thesis entitled....for
the Degree of Doctor of Philosophy.

Part I—(for the examiners of the thesis only).

A.—The Examiners report after the examination of the thesis—

- (i) that the thesis submitted by the candidate is a piece of research work characterised—
 - (a) by the discovery of facts ; or
 - (b) by a fresh approach towards interpretation of facts or theories ;
and
- (ii) that the thesis evinces the candidate's capacity for critical examination and judgment, and
- (iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Philosophy in the University of Allahabad.

B.—After the examination of the thesis, the examiners recommend that the candidate be rejected without further test.

C.—After the examination of the thesis, the examiners recommend that the candidate be permitted to re-present the thesis in a revised form. Chapter
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Part II—(for the examiners of the viva voce Examination).

The examiners report that they have examined the candidate viva voce on the subject of the thesis and that they have satisfied themselves, (i) that he is acquainted with the literature on the subject. (ii) that the thesis is genuinely the work of the candidate and (iii) that the candidate evinces a capacity for critical examination and judgment.

Part III—(The examiners are to give here a concise statement of the grounds on which the decision summarised under Part I or Part II is based).

Part IV—The examiners recommend—

Strike out either (a) or (b).

(a) that the Degree of Doctor of Philosophy in the Faculty be conferred on the candidate.

(b) that the Degree of Doctor of Philosophy be not conferred on the candidate.

Strike out either (i) or (ii).

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(c) (i) that the candidate be allowed to represent his thesis within six months from the date of the decision. The lines on which the Examiners recommend a revision of the thesis shall be communicated to the candidate.

(ii) that the candidate be allowed to re-appear at the viva voce examination within six months from the date of the decision.

Examiner of the thesis

Viva Voce Examiner

D

Ordinances for the Degree of Doctor of Letters in Economics

1. A candidate for the Degree of Doctor of Letters must be either:

(i) (a) a Doctor of Philosophy of this University of at least two years' standing, or

(b) a Master of Arts of this University of at least seven years' standing, or

(ii) (c) a Master of Arts of at least seven years' standing of a University recognised by this University

who has resided at the University for at least one year, or

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- (d) a Doctor of Philosophy of another University recognised by the Allahabad University who has resided at the University for at least one year.

Candidates under (b) and (c) must satisfy the Faculty that the work already done by them is of sufficient merit to earn exemption from the D. Phil. Degree.

2. Every candidate who intends to supplicate for the said degree shall communicate his intention to do so to the Registrar stating the subject chosen by him for the thesis and support his application by submitting the copy of the contribution published by him towards the advancement of the subject of his study. He shall submit a certificate from two members of the Faculty that he is a fit and proper person to supplicate for the Degree of Doctor of Letters.

3. The application shall be placed before the Faculty of Commerce which shall consider the suitability of the subject.

4. In case the Faculty approves of the subject

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University a person to advise the candidate.

5. On a report from the adviser that the candidate's thesis is likely to be submitted within six months, the Faculty shall appoint not less than three and not more than five examiners, two of whom shall be appointed to conduct the viva voce examination.

6. After the thesis is completed, the candidate shall supply five printed or typed copies of his thesis. The thesis shall comply with the following conditions :—

The thesis submitted by the candidate must be entirely his own work and must be an original contribution to knowledge characterised either by the discovery of new facts and their significance or by a new interpretation of facts or theories and in either case it should evince the capacity of the candidate for critical examination and judgement. It shall also be satisfactory so far as its literary presentation is concerned, and must be suitable for publication.

7. The candidate may incorporate in his thesis the contents of any work which he may have published on the subject, but he shall not submit as his thesis any work for which a degree has already

been conferred on him in this or any other University. The candidate may also submit as subsidiary matter any printed contribution or contributions to the advancement of his subject. Chapter
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8. The examiners shall examine the thesis and other published work of the candidate and shall submit their reports on the prescribed form either conjointly or separately. The examiners may consult one another before submitting their reports. They may make such suggestions as they deem fit for the improvement of the thesis. These suggestions shall be communicated to the examinee.

9. After the examiners have read the thesis they ~~may~~ recommend that the candidate be rejected or be allowed to re-present the thesis in a revised form not earlier than six months and not later than two years from the date of the decision of the Faculty.

10. If the majority of Examiners report that the thesis is satisfactory, the University shall arrange the viva voce examination.

11. If the viva voce examiners are also satisfied, the recommendations shall be placed before the Faculty for necessary action.

12. The Faculty shall accept all unanimous recommendation or recommendations made by a

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majority of the Examiners. In the event of no definite recommendations being made by a majority of Examiners the Faculty may allow the candidate to re-present the thesis or may appoint one or more fresh examiners to examine the thesis.

13. In case the recommendation of the viva voce Examiners of the thesis differs from the recommendation of the Examiners of the thesis, the candidate may be asked to re-appear for the viva voce examination within six months. If the candidate fails to satisfy the viva voce Examiners a second time, he shall be rejected.

14. No candidate shall be allowed to re-present his thesis more than once or to re-appear at the viva voce examination more than once.

15. The candidate shall on publication of the thesis state on the title page that it was a thesis approved for the D. Litt. Degree of the Allahabad University :

16. The following fees shall be charged :—

(a) A fee for guidance and supervision of work as laid down in Ordinance 19 (2) of Chapter XXVII.

(b) A fee of Rs. 250 for the examination.

17. Each Examiner shall be paid a fee of Rs.100 for reading the thesis and a fee of Rs.100 for examining the candidate viva voce. Chapter
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Note.—When an Examiner conducts the viva voce examination and is also one of the Examiners to assess the thesis he shall be paid only Rs. 150.

UNIVERSITY OF ALLAHABAD

FACULTY OF COMMERCE

Report of Examiners for D. Litt. Degree.

The Examiners report to the Faculty that.... student of....Department has presented a thesis entitled....for the Degree of Doctor of Letters.

Part I.—(For the Examiners of the thesis only).

A.—The Examiners report after the examination of the thesis—

(i) that the thesis submitted by the candidate is an original contribution to knowledge characterised—

(a) by the discovery of new facts and their significance.

or

(b) by a new interpretation of facts or theories,

and

- (ii) that the thesis evinces the candidate's capacity for critical examination and judgment ;

and

- (iii) that the thesis is satisfactory so far as its literary presentation is concerned and is suitable for publication as a thesis approved for the Degree of Doctor of Letters in the University of Allahabad.

B.—After the examination of the thesis, the Examiners recommend that the candidate be rejected without further test.

C.—After the examination of the thesis, the Examiners recommend that the candidate be permitted to represent the thesis in a revised form.

Part II.—(For the Examiners of the viva voce Examination).

The Examiners report that they have examined the candidate viva voce on the subject of the thesis and on the subject relevant thereto, and they have satisfied themselves, (i) that the thesis is genuinely and entirely the work of the candidate and (ii) that the candidate evinces the capacity for critical examination and judgment.

Part III.—(The Examiners are to give here a concise statement of the grounds on which the decision summarised under Part I or Part II is based).

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Part IV.—The Examiners recommend:—

Strike out either (a), (b) or (c).

(a) that the Degree of Doctor of Letters in the Faculty be conferred on the candidate ;

(b) that the lower Degree of Doctor of Philosophy be conferred on the candidate ;

(c) that the Degree of Doctor of Letters be not conferred on the candidate ;

Strike out either (i) or (ii).

(d) (i) that the candidate be allowed to represent his thesis within one year from the date of the decision ;

(ii) that the candidate be allowed to reappear at the viva voce examination within one year from the date of the decision.

Examiner of the thesis

Viva Voce Examiner

Ordinances for the Degree of Master of Commerce

1. A candidate, who after passing the examination for the Degree of Bachelor of Commerce, has completed a regular course of study in the University for one academical year, shall be admitted to the Previous Examination for the degree of Master of Commerce.

2. A candidate, who after passing the M. Com. Previous Examination, has completed a regular course of study for one academical year in the University, shall be admitted to the Final Examination for the degree of Master of Commerce.

3. The Examination for the Degree of M.Com. shall comprise two parts :—

M.Com. Previous—Written examination in four selected subjects.

M.Com. Final—A thesis or a dissertation on a problem relating to Indian Commerce, Industries, Finance or Transport ; or a written examination in four selected subjects other than those taken up in M.Com. Previous Examination from the

list of subjects specified for the purpose ; ^{Chapter} XXXVIII
and viva voce.

(1) M.Com. Previous—

The written examination shall comprise four papers of three hours each. The candidates may offer any four of the following subjects on each of which one paper will be set :—

1. The Organisation of Industries in India.
2. Corporation Finance.
3. The Organisation of Markets.
4. International Banking and Foreign Exchange.
5. International Trade and Fiscal Policy.
6. Transport.
7. Insurance.
8. Economics of Agriculture with special reference to India (Rural Economics).
9. Co-operation.
10. Advance Business Economics.
11. Pure and Applied Statistics.
12. Economic Activities of the State.
13. Labour and Urban Problems.

(2) M.Com. Final Examination—The Thesis or Written Examination.

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Every candidate for the M.Com. Final Examination shall submit along with his application three printed or type-written copies of a thesis on some problem concerning Indian Commerce, Finance, Transport or Insurance or any other allied subject approved by the Committee of Courses and Studies in Commerce* and shall in foot-notes or preface quote precise references to published works or reports on which he has relied for his facts and figures.

N.B.—No student will be allowed to take up a subject in which instruction is not provided. No student will also be allowed to take a subject in which he specialised in the B. Com. Final Examination.

4. A candidate for the M. Com. Final Examination shall pursue his research at Allahabad under the superintendence of a member of the teaching staff to be nominated by the Head of the Department of Commerce.

5. He shall pursue his research at Allahabad unless the Vice-Chancellor, on the recommendation of the Head of the Department of Commerce, gives him leave of absence for ordinarily not more than three months on the ground that it is in the

*The candidate must select the subject for his thesis within three months of his admission to the M.Com. Previous class in consultation with the Head of the Department for the sanction of the same by the Committee of Courses

interest of his research that he should work elsewhere. Chapter
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M. Com. Examination, Previous

Each paper—100 marks	} Minimum Pass Marks 36 per cent. of the aggregate marks in the Previous Examination.

M. Com. Examination, Final—Thesis or Papers Examination—Thesis

External Examination—200 marks	} Minimum Pass Marks 36 per cent. of the ag- gregate marks.
Internal Examination—200 marks	
Viva voce on General Commercial	
Knowledge—100 marks.	

Written Examination

Each paper—100 marks. Viva voce on General Commercial Knowledge—100 marks	} Minimum Pass Marks 36 per cent. of the aggregate marks.

Note.—The marks of the two examinations, previous and Final, will be added to determine the position and class on the pass List of the Final year.

1st Class—60 per cent. and over.

2nd Class—48 per cent. and over.

and Studies in Commerce in time.

The thesis must be submitted to the Registrar before March 1, every year.

CHAPTER XXXIX

Ordinances for the Examination for Certificate of Proficiency in French/German/Italian

1. A certificate of proficiency in French/German/Italian will be granted to those students who have

- (a) attended the two years' course provided by the University in the subject and
- (b) passed the prescribed examination.

2. The examination will consist of two papers and a *viva voce*. The maximum marks in each paper shall be 50 and the minimum pass marks an aggregate of 36 out of 100. The maximum marks for the *viva voce* shall be 50; the minimum pass marks, 15.

A candidate passing in the papers and failing in *viva voce* shall be granted a certificate endorsed to that effect.

3. A candidate who has failed in the examination may be permitted to appear again after one year.

4. The names of successful candidates shall be published in one list arranged in alphabetical order.

Note.—Students reading French and German who are not University students are required to pay Admission Fee also (*vide* Ex. C. Res. No.219 (2) dated 22.10.1932)

Note.—A monthly fee of Rs. 4 is to be charged from students taking French and German or either of those languages for ten months in the session (*vide* Ex. C. Resolution Nos. 175 dated 3-9-1927 and 106 dated 23-4-1932).

A fee of Rs. 4 p. m. is to be charged when Italian is combined with either French or German (Vice-Chancellor's order dated 5-8-1939. File No. 481).

5. The examination shall be held on a convenient day before study leave for University examination candidates commences.

Regulation

SCHEME OF EXAMINATION

At the end of two years' course a candidate shall be admitted to the following examination :—

- (i) One paper will be set with three passages for translation into English ; two from the prescribed text and one from the book recommended for general reading. Time allowed 3 hours. Maximum marks 50.
- (ii) In the second paper two unseen passages will be set, one to be translated into English from French/German/Italian, and the other to be translated into French/German/Italian from English. Candidates will also be required to answer questions on grammar and idiom. *Thirty-five marks shall be assigned to the unseen passages and 15 to the questions on grammar and idiom.* Time allowed 3 hours. Minimum pass

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marks in the two written papers taken together shall be 36.

- (iii) Each candidate will be examined *viva voce* for 10 minutes to test his practical knowledge of the language, both for reading and speaking purposes. Maximum marks 50. Minimum pass marks 15.

CHAPTER XL

Ordinances for the Examination for a Certificate of Proficiency in Military Science

1. A certificate of Proficiency in Military Science will be granted to those students who are members of the University Training Corps and who have

- (a) attended the two years' course provided by the University in the subject and
- (b) passed the prescribed examination.

2. The examination will consist of two papers and one practical test. A candidate shall appear in the Practical Test at the end of the first year and in the papers in the second year. Maximum marks in each paper shall be 50 and the minimum pass marks an aggregate of 36 out of 100. The maximum marks for Practical shall be 50, the minimum pass marks 15. The aggregate of the minimum

pass marks for all the three combined shall be 54 out of 150. Chapter
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3. A candidate who has failed in the Practical may be allowed to appear again along with papers in the year immediately succeeding.

4. A candidate who has failed in the written examination may be permitted to appear again after one year.

5. The names of successful candidates shall be published in one list arranged in alphabetical order.

6. The Practical test shall be held on a convenient day before March and the written examination shall, as far as possible, be held not later than January.

CHAPTER XLI

Ordinances for the Examination for a Junior Diploma in Indian Music

1. A Junior Diploma in Music will be granted to a student who has (a) attended a regular course of study at the University for two years and (b) passed the prescribed examination.

2. A candidate who has put in the required

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XLI

percentage of attendance at lectures for the Junior Diploma Examination may be permitted to appear in the following year without being required to attend lectures afresh.

3. A candidate may offer any one of the following subjects :—

- (i) Vocal Music (accompaniment with Harmonium will not be allowed .

Instrumental Music—only one of the following instruments will be allowed for the purpose of examination in instrumental music : —

- (a) Sitar
- (b) Esraj
- (c) Sarod
- (d) Violin
- (e) Harmonium
- (f) Flute
- (g) Tabla or Pakhawaj •
- (h) Sarangi

4. Every candidate appearing for the examination of instrumental or vocal music must

possess a knowledge of Tals, as detailed in the syllabus laid down.

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5. The examination will consist of a paper and a practical examination in each subject. The maximum marks in the written paper on theory shall be 50 and in the practical test 100

The minimum pass marks in the total shall be 50 ; and 33 per cent. *separately* in theory and practice.

6. The division of marks shall be as follows :—

Marks	Class
90	I
70	II
50	III

7. The fee for the Junior Diploma Examination shall be Rs 10.

8 Ex-students of the University will be eligible for admission to the Music classes.

9. The tuition fee for each academic year shall be Rs 20 payable in monthly instalments of Rs 2 on or before the 20th of every month. In the case of student's offering instrumental music the fee will be Rs. 3 per month." Non-University students may be admitted to the

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XLI

Junior Diploma course in Music on payment of an Admission fee of Rs. 4 and subject to such conditions as may be laid down. When a student fails to make payment of his monthly fees on the due date he shall be required to pay an additional fee of one anna every day for the first month and two annas every day for the second and third months. Students who are admitted to the Junior Diploma Classes shall pay the tuition fees for the whole session. Students shall be required to deposit Rs. 5 as caution money.

10. Students will not be allowed to appear at the examination unless they have attended 60 per cent. of the lectures and practical classes.

Ordinances for the Examination for a Senior Diploma in Indian Music

1. A Senior Diploma in Music will be granted to a student who after passing the Junior Diploma or the Diploma in Music of the University of Allahabad, *or the Intermediate Examination of the U.P. Board or Benares Hindu University or any other equivalent examination with Music as one of the optional subjects or as an additional subject has* (a) attended regular course of study at the University for two years and (b) passed the prescribed examination

2. A candidate who has put in the required percentage of attendance for the Senior Diploma Examination but does not appear at or fails in the examination may be permitted to appear in the following year or years without being required to attend lectures again.

3. A candidate may offer any one of the following subject :—

- (i) Vocal Music (accompaniment with Harmonium will not be allowed).
- (ii) Instrumental Music :—For the present *only Sitar or Violin or Esraj or Tabla* will be allowed.

4. Every candidate appearing for the examination in Instrumental or Vocal music must possess a knowledge of Tals, as detailed in the syllabus laid down.

5. The examination will consist of a paper and a practical examination in each subject. The maximum marks in the written paper on theory shall be 50 and in the practical 100.

“The minimum pass marks shall be 33 per cent. in the total and also in theory and practice *separately*.”

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6. The division of marks shall be as follows :—

Marks	Class
90	I
70	II
50	III

7. The fee for the Senior Diploma Examination shall be Rs. 15.

8. Ex-students of the University shall be eligible for admission to the music classes.

9. The tuition fee for each academic year shall be Rs. 30 payable in monthly instalments of Rs. 3 on or before the 20th of every month. In the case of students offering instrumental music the fee will be Rs. 4 per month. When a student fails to make payment of his monthly fees on the due date he will be required to pay an additional fee of one anna every day for the first month and two annas for the second and third months. Students who are admitted to Senior Diploma classes shall pay the tuition fees for the whole session. Students shall be required to deposit Rs. 5 as caution money.

10. Students will not be allowed to go up for the examination unless they have attended 60 per cent. of the lectures.

CHAPTER XLII

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A

**Ordinances for the Examination for a
Diploma in Painting**

1. Students who have passed the Intermediate Examination of the Board of High School and Intermediate Education of the United Provinces, or of any University in British India incorporated by any law for the time being in force, or any examination recognised by the Academic Council as equivalent thereto, may be admitted to the class for diploma in painting.

2. A diploma in painting will be granted to those students who have :—

- (a) attended the two years' course provided by the University in the subject, and
- (b) passed the prescribed examination.

3. The examination will consist of :

- (i) A written paper on History of Indian Art and Technique carrying 100 marks.
- (ii) A practical test carrying 200 marks.
- (iii) Candidate's work during two sessions carrying 200 marks.

4. Candidates who obtain not less than 60

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per cent. marks in the total aggregate shall be declared to have passed in the First Class, and those obtaining not less than 45 per cent. marks shall be declared to have passed in the Second Class.

5. A candidate who has failed in the examination may be permitted to appear again on payment of the prescribed examination fee.

6. The class fee for the course will be Rs. 4 per month payable for 10 months in the year.

B

Ordinances for the Examination for a Diploma in Physical Education

1. A Diploma of Physical Education will be granted to those students who have :

(a) attended one year's course provided by the University in the subject ; and

(b) passed the prescribed examination.

2. The examination will consist of two papers and one practical test. The maximum marks in each paper shall be 100 and the minimum pass marks in each paper 25 per cent. and an aggregate of 36 per cent. in all the papers combined. The maximum marks for the practical shall be 100 and the minimum pass marks 33. The aggregate

of the minimum pass marks for the theory and practical combined shall be 36 per cent.

3. A candidate who has failed in the practical shall appear again along with the theory papers. But a candidate who has failed in the theory alone may be allowed to appear privately in theory in the year immediately succeeding provided he is a teacher in any of the local schools.

4. The names of the successful candidates shall be published in one list arranged in alphabetical order.

Regulations

Candidates who pass the examination for the Diploma for Physical Education shall be classified in three classes :—

- | | |
|-----------|---|
| 1st class | .. 60 per cent. or more of the total marks in the Diploma subjects. |
| 2nd Class | .. 48 per cent. or more of the total marks in the Diploma subjects. |
| 3rd class | .. 36 per cent. or more, but less than 48 per cent. of the total marks in the subjects. |

Candidates must obtain at least 25 per cent. in each theory paper and 33 per cent. in the practical

C

Ordinances for Examination for a Diploma in Local Self-Government Administration

1. A diploma in Local Self-Government Administration shall be granted to a student who

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XLII

has attended a regular course of study at the University for one academic year and passed the prescribed examination.

2. Any graduate of the University or of any other University in British territory recognised by the law of the place in which it is situated, or of any University which the Academic Council may from time to time recognise, may be admitted to the course.

3. The Examination for the Diploma in Local Self-Government Administration shall be conducted by means of papers and a *viva voce* and practical training test.

4. The subjects of each paper shall be the following :—

Paper I—Principles of Local Self-Government and the principal systems of Local Government found in the world, particularly the English, American, French, and German; Constitution of Local Bodies: Central Local relations; functions—Education, Sanitation, Trading, etc.

Paper II—Local Self-Government in India with special reference to the United

Provinces. The Historical Back-ground. Municipalities ; District Boards ; Village Panchayats. Their Constitution and Functions.

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XLII

Paper III—Local Finance and Accounts with special reference to the Local Bodies in the United Provinces. Local Revenues and Expenditure Assessments. Budget-making and Appropriation. Grants-in-aid. Borrowing. Accounts. Audit and Surcharge.

Paper IV—Principles of Town Planning. Land Acquisition. Problems arising in connection with Municipal Engineering. Water-Works ; Waste disposal and sewerage. Public Health.

5. Each written paper shall carry 100 marks. The *viva voce* test which will cover all the subjects shall carry 100 marks and the practical training test shall carry 100 marks.

6. Candidates who obtain not less than 60 per cent. marks in the total aggregate shall be declared to have passed in the First class ; those obtain-

Chapter XLII ing not less than 48 per cent. in the Second class and those obtaining not less than 36 per cent. in the Third class provided they obtain at least 33 per cent. of marks separately in the Practical Training Test.

7. The tuition fee for each academic year shall be Rs. 80 payable in monthly instalments of Rs. 8 on or before the 20th of each month.

8. In order to be eligible to appear at the Examination candidates will be required to attend 75 per cent. of the lectures and practical training class.

9. A candidate who after keeping the prescribed terms is unable to appear at the examinations or fails to pass the examination may be permitted to appear in a subsequent year without being required to attend lectures afresh provided that he takes the subsequent examination within three years following the year in which he failed to appear or pass.

D

Ordinances for the Certificate Examination in Photography

1. A Certificate for Proficiency in Photography will be granted to a student who has :—

(a) attended a regular course at the University for one session.

(b) passed the prescribed Examination.

2. The Examination will consist of one paper carrying 100 marks and a Practical test carrying 100 marks.

3. It will be necessary to pass separately in Theory and Practical tests. The division of marks shall be as follows :—

1st Class 60%

2nd Class 48%

3rd Class 36%

4. The fee for the Examination shall be Rs. 5.

5. The tuition fee for each academic year shall be Rs. 30 payable in monthly instalments of Rs. 3 at the University Counter on or before 20th of every month.

6. Admission to the Course will be conferred to *bona fide* University students.

7. Such candidates as have failed at the Examination or have not appeared after putting in the required attendance shall be eligible to appear at the next ensuing examination only on payment of an Examination fee of Rs. 15. They can be allowed to attend lectures if they so desire.

8. Students attending 75 per cent. of the lecture and practical work separately will be eligible for the examination.

E

Ordinances for the Certificate Examination in Social Service and Village Uplift.

1. A certificate of Proficiency will be awarded to students who may be found to have qualified themselves at a test to be held in February every year.

2. The Course will be open to all students of the University.

3. The period of instruction will extend from August to February. The course will comprise 30 lectures and 7 days of field work. At least 75% attendance will be required to qualify for the test.

4. The examination will be conducted partly by means of written papers and partly *Viva Voce*. There will be,

(a) Three written papers each carrying 50 marks,

(b) Practical work marked by the Supervisor carrying 75 marks. Each paper will be of 2 hours duration and 33 per cent will be the minimum pass marks.

F

Chapter
XLII**ORDINANCES FOR THE EXAMINATION
OF DIPLOMA IN APPLIED ARTS AND
CRAFTS**

● (for girls only)

1. Students who have passed the Intermediate Examination of the Board of High School and Intermediate Education of the United Provinces, or any other Examination recognised by the Academic Council as equivalent thereto, may be admitted to the course for Diploma in Applied Arts.

2. A Diploma in Applied Arts will be granted to those students who have :—

(a) attended the two years course in the subject, provided by the University,

(b) and passed the prescribed examination.

3. The Examination for the Diploma in Applied Arts shall be conducted by means of papers, practical test and home work. There shall be one written paper carrying 100 marks, practical test carrying 200 marks and Home work carrying 200 marks.

4. Candidates who obtain not less than 60 per cent. marks in the total aggregate shall be de-

clared to have passed in the First class, those obtaining not less than 45 per cent. in the Second class, provided they obtain at least 35 per cent. marks in the Practical Test and Home work.

5. The tuition fee for each academic year shall be Rs. 30 only payable in ten monthly instalments of Rs. 3.

6. In order to be eligible to appear at the examination candidates shall be required to attend 75 per cent. of the lectures and practical classes.

7. A candidate who after keeping the prescribed forms is unable to appear at the examination or fails to pass the examination may be permitted to appear in a subsequent year without being required to attend classes provided the subsequent examination is taken within three years following the year of failing to appear or passing.

**TEXT-BOOKS AND SYLLABUSES
PRESCRIBED FOR THE EXAMINATIONS
OF 1950**

**B.A. EXAMINATION
ENGLISH**

Compulsory English (B.A., and B.Sc., Examinations).

There will be two papers and a *viva voce* test.

Paper I—An Essay on a subject of general interest
(maximum marks 40.)

The following books are recommended:—

WESTAWAY: The Writing of Clear English.

TREBLE AND VALLINS: The ABC of English Usage.

DIXON: Dictionary of English Idioms.

FOWLER: The King's English (abridged edition).

MURISON: English Composition.

MAIR: The Writing of English.

McMORDIE: English Idioms.

DENISON ROSS: This English Language.

Paper II—General English.

Any one of the following:—

(i) LYSAGHT: A Reading of Life.

(ii) RUSSELL, BERTRAND: The Conquest of Happiness.

(iii) BARKER, ERNEST : The Values of Life.

(iv) GALSWORTHY, J. : Short Stories.

Questions will be put on an Unseen passage and Idiom and Usage. (Max. Marks 35).

Viva voce—A test of general reading, and of command over the language (Max. Marks 25).

N. B. (a) A journal of general reading for *two* years shall be kept by each student, and submitted periodically to his seminar teacher ;

(b) The journal should be brought to the *viva voce* Examination by the candidate himself, and should be returned to him by the Examiners ;

(c) At least *six* books mentioned by the candidate in the Journal should be written in the English language, and of general interest.

OPTIONAL ENGLISH LITERATURE

There will be *three* papers, each carrying 50 marks.

Paper I—*Drama*.

For detailed study :—(i) SHAKESPEARE : Hamlet
(ii) GALSWORTHY : Strife

For general Reading :—(i) SHAKESPEARE: Mid-summer Night's Dream.

(ii) GALSWORTHY: The Silver Box, or Justice (whichever text is available in July 1948)

Context questions are to be asked only from the books for detailed study. Critical questions are to be set on all the prescribed plays (detailed and general reading).

Books recommended for reference on Shakespeare :—

LAMBORNE: Shakespeare—The Man and His Stage.

DOWDEN: Shakespeare's Mind and Art.

BRADLEY: Shakespearean Tragedy.

Paper II—*Poetry*.

1. PALGRAVE: Golden Treasury (Macmillan's edition).

The following poems are prescribed :—

WORDSWORTH: 1. She was a Phantom.

2. Three Years She Grew.

3. Ode to Duty.

4. Milton.

5. Nature and the Poet.

6. Ode on Intimations of Immortality.

7. The Reaper.

SMELLEY :

1. Love's Philosophy.

2. To Night

3. When the Lamp is Shattered

4. To a Skylark

5. West Wind.

TENNYSON :

1. Choric Song of the Lotos Eaters

2. Tears, Idle Tears

3. The Lady of Shalott

4. Come into the Garden, Maud

5. The Ballad of the Revenge

6. Crossing the Bar.

BROWNING, R : 1. Rabbi Ben Ezra

2. Prospice

BRIDGES, ROBERT : 1. Nightingales

2. A Passerby

3. London Snow

HARDY, THOMAS : 1. Weathers

2. In Time of "The Breaking of Nations".

3. The Darkling Thrush.

KIPLING, RUDYARD : 1. Sussex

2. A Dedication

MASEFIELD, JOHN : 1. Cargoes.

Paper III—*Prose*.

HARDY : Mayor of Casterbridge

Note :—No context questions will be set.

STEVENSON : *Virginibus Puerisque*, omitting the first three Essays and “Some Portraits by Raeburn” “The English Admirals”.

A Book of Modern Prose (Indian Press).

The following authors are prescribed :—Carlyle ; Mill ; A. G. Gardiner ; Hazlitt ; Walter Raleigh ; Edmund Gosse ; Augustine Birrell ; G. Lowes Dickinson ; Robert Lynd ; J. B. Priestley ; Stephen Leacock.

Books recommended for reference :—

STRONG, L. A. G. and RADLICH : *Life in English Literature* (Gollancz).

HODGSON, G : *English Literature* (Blackwell).

WYATT: Tutorial History of English Literature
(University Tutorial Press).

GOSSE: Modern English Literature. (Heinemann)

STOPFORD BROOKE and SAMPSON: English
Literature (Macmillan).

ALBERT: History of English Literature (Harrap).

BERNARD GROOM: A Short History of English
Literature.

CLASSICAL LANGUAGES

(a) Sanskrit

Paper I—(a) Kādambari (Nirnaya Sagar Press
edition PP. 98-162 and 195-211
and Peterson edition 50-82 and
102-111....PP. 25 marks.)

(b) Manusamhitā Chap. I and II....
15 marks.

(c) Chāndogya-Upanishad Chap.
.... 10 marks.

Paper II—

(a) Uttara-Rāma-Charita .. 25 marks.

- (b) Kirātārjunīyam, Cantos I—II .. 15 marks.
 (c) Meghadūta—Uttaramegha .. 10 marks.

Paper III—

- (a) Translation English to Sanskrit 10 marks.
 (b) Grammar with special reference to Kāraka, Samāsa, and Kridanta .. 15 marks.
 (c) History of Classical Sanskrit Literature .. 10 marks
 (d) Rudiments of Ancient Indian Culture .. 15 marks

Books recommended :—

- Under (b) (i) KALE : Higher Sanskrit Grammar.
 (ii) B. R. SAKSENA—Sanskrit Vyakarana Pravesika.
 (iii) V. S. APTE—Guide to Sanskrit Composition.
 (c) History of Sanskrit Literature.
 (i) A. B. KEITH : Classical Sanskrit Literature excluding chap. I and X.
 (ii) H. R. AGGARWAL : A Short History of Sanskrit Literature.

(iii) BALADEVA UPADHAYAYA : Sanskrit
Sahitya ka Itihasa.

(d) Rudiments of Ancient India Culture.

P. K. ACHARYA—Elements of Hindu
Culture and Sanskrit Civilization.

N.B.—(1) No intricate question on Philosophy shall be
set on Paper 1 (c).

(2) Sanskrit must be written in the Devanagari
character,

(b) Arabic

There shall be three papers.

PAPER I—

Prose	..	40 marks	} 50 marks.
Grammar .	..	10 marks	

PAPER II—

Poetry	..	35 marks	} 50 marks.
History of Literature	..	10 marks	
Figures of Speech, etc.	..	5 marks	

PAPER III—

Short Essay in Arabic	..	20 marks	} 50 marks.
Translation from English into Arabic (Unseen)	..	15 marks	
Translation from Arabic into English (Rapid Reading)	..	15 marks	
			150 marks.

Note.—The questions shall be distributed over all the books prescribed as far as possible and no undue predominance shall be given to any particular book.

Prescribed Course—

Papers I and II.—Prose and Poetry respectively.

(i) Texts Prescribed :—

(1) The Sūra Khof.

Jawahiru'l-Bubur, (Lahore 1942).

(ii) Grammar—Books recommended : (1) *Fu-snl-i-Akbari* (up to end of the Khāssiyyātu'l Abwāb); (2) *Hidayatu'n-Nahw*; (3) Thatcher's *Arabic Grammar*; (4) Thorton's *Arabic Grammar*, Revised by R. A. Nicholson. (Cambridge University Press).

Questions on Grammar will be set in both the papers.

Note.—A knowledge of Arabic Grammar will be expected.

(iii) History of Arabic Literature—The following books are suggested :—

(1) M. G. Zubaid Ahmad, *Adabu'l Arab*.

(2) H. A. R. Gibb, *Introduction to Arabic Literature*. (Oxford University Press, 1928).

Paper III—Rapid Reading, and Translation from English into Arabic.

Book recommended for rapid reading:—

Quran, Juz 29.

Note 1.—Arabic words must be written in Arabic characters.

Note 2.—A knowledge of the outline of the History of Arabic Literature with special reference to the authors prescribed is expected.

(c) Persian

There shall be three papers.

PAPER I—

Prose	40 marks	} 50 marks.
Grammar	10 marks	

PAPER II—

Poetry	35 mark	} 50 marks.
History of Literature	..	..	10 marks
Figures of speech, etc.	...	...	5 marks

PAPER III—

Short Essay in Persian	...	20 marks	} 50 marks.
Translation from English into Persian (Unseen)	...	15 marks	
Translation from Persian into English (Rapid reading)	...	15 marks	
	...	15 marks	

150 marks.

Prescribed Course :—

(i) Paper I—(a) Prose :—

Selections from the following authors, as contained in the *Nathra* (published by the Kitabistan, Allahabad) :—

Bal'ami, Nizām-ul-Mulk-i Ṭūsī, Nizāmī-i 'Arūdī-i Samarqandī, Khwand-Amīr, Abu'l-Fadl omitting pp. 118-227), Zuhūrī, Ta'rikh-i-Wassāf, and 'Atā Malik Juwaynī.

(b) Grammar—

Books recommended :—

- (1) Mumtaz Husayn : خزانة الفوائد
- (2) M. H. Naisri : مستحسن الفوائد
- (3) Forbes : *Persian Grammar*.
- (4) Platts and Ranking : *Persian Grammar*.

(ii) Paper II,—(a) Poetry :—

Selections from the following authors, as contained in the *Shi'ra* (published by the Kitabistan, Allahabad) :—

- (i) Qasidas : Kamāl-i-Isfahānī, Khāqānī, Adib-ul-Manalik, Salmān-i-Sāwajī, 'Urfī, Fayḍ

(ii) Mathnawis: Shahanama of Firdausi, Nizami, and Jalāluddīn-i-Rumi.

(iii) Ghazals :—Rudaki, ‘Irāqī, Sa‘dī, Khusraw, Hāfiz, Sā‘ib, Nazirī, Kalim, Ghālīb.

Note.—A thorough knowledge of Persian Grammar will be excepted.

(b) History of Literature :—

Books recommended :—

- (1) Shibli *Shi‘rul-‘Ajām*, Vols. I, II, and III,
- (2) Levy, *Persian Literature* (Oxford University Press).

Note.—A knowledge of the outlines of the history of Persian Literature with special reference to the authors prescribed will be expected.

Paper III—Rapid Reading—*Adabiyyat-i-‘Ajām*. Part III by A. H. Faridī, New Edition, (Published by Sri Ram Mehra & Co., Agra).

Note 1.—Students are required to have such knowledge of the etymology of the Arabic language as will enable them to explain all Arabic words and phrases which may occur in the text-books and in the books recommended for rapid reading in Persian.

Note.—Persian words must be written in Persian characters.

Hindi

There shall be three papers :—

Paper I—Poetry and History of Hindi Literature (60 marks).

A—Poetry.

Books prescribed :—

Kabirdas : Sant Kabir Sankshipta (Sahitya Bhawan, Allahabad).

Gauri 1-9, 17-24, 33-46.

Asa 1-10.

Tilanga 1-4.

Kedara 1-6.

Bhairava 1-5, 10-12.

Vibhas 1-5.

Slokas 1-40, 81-105, 128-152.

SURDAS : Sur Sushama.

TULSIDAS : Ramcharit Manas, Dvitiya Sopan.

BHUSHAN : Shivaraj Bhushan (Upama to Vibhavana; Purvarupa, Bhavika, Milita).

S. B. MISRA and R. S. SHUKLA : Adhunik Braj Bhasha Kavya.

1. Jagannatha Das Ratnakar (Gangavataran, Braj Smriti).
2. Rai Devi Prasad Purna (Vasant Ritu, Grishma Ritu, Varsha Ritu).
3. Satya Narain Kavi Ratna (Upalambha, Bhramar Duta).
4. Viyogi Hari (Bhisma Pratijnya, Chhatrapati Shivaji).
5. Misra Bandhu (Jivatma aur Parmatma, Sena Varnana).
6. Rama Shankar Shukla (Uddhava Gopi Samvada).

D. VARMA and R. K. VARMA : Adhunik Hindi Kavya (Saraswati Publishing House, Allahabad).

1. Maithili Sharan Gupta (Ankh Michauni, Urmila ki Virah Vyatha, Kaikeyi ka Paritap, Yashodhara).
2. Ayodhya Singh Upadhyaya (Priya Pravasa, Bechara Bap).

3. Jai Shanker Prasad (Gita, Shilp Saundary, Ida).
4. Suryakant Tripathi (Badal Rag, Jago phir ek Bar).
5. Sumitra Nandan Pant (Maun Nimantran, Ek Tara, Bapu ke Prati).
6. Mahadevi Varma (Rashmi, Uljhan, Gita).
7. Ram Kumar Varma (Ashanta, Gita).
8. Makhan Lal Chaturvedi (Pushpa ki Abhilasha, Qaidi aur Kokila).
9. Subhadra Kumari Chauhan (Jhansi ki Rani, Viron ka Kaisa ho vasant).

B—Outlines of the History of Hindi Literature.

Books recommended :—

SHYAM SUNDAR DAS : Hindi Sahitya.

KRISHNA SHANKAR SHUKLA : Adhunik Hindi Sahitya ka Itihas.

MISHRABANDHU : Hindi Navaratna (revised edition).

VAKSHI : Hindi Sahitya Vimarsha.

Questions on Alankar, Chhanda and Literary Criticism will be put in this paper. The following books are recommended :—

VISHWANATH PRASAD MISRA : Vangmaya
Vimarsha.

R. K. VARMA : Sahitya Samalochana,

GOPAL LAL KHANNA : Kavya Kala.

VAKSHI : Vishva Sahitya.

PRASAD : Kavya aur Kala.

BHAGWANDIN : Alankar Manjusha.

RAGHUVAR DAYAL MISRA : Pingal Prakash.

The following Alankaras and Chhandas are
recommended for intensive study :—

Arthalankara.

Upama, Rupaka, Pratipa, Utpreksha, Vyatireka, Ullekha, Asangati, Nidarshana, Vibhavana, Atishayokti, Parikar, Vyaghata, Parisankhya, Apahnuti, Anyokti, Drishtanta, Sandeha, Kavyalinga, Svabhavokti, Samasokti, Aprastutaprashansa, Vyajastuti (Ninda), Virodhabhasa, Aksepa, Arthan-taranyasa, Tulyayogita, Dipaka, Visheshokti, Sankara, Sansrishti.

Sabdalankara.

Anuprasa (Chheka, Vriya, Lata). Yamaka, Punaruktavadabhasa, Shlesha, Vakrokti.

Metres.

VARNIKA : Druta-vilamvita, Malini, Mandak-ranta, Vasantatilaka, Shardula-vikridita, Savaiya, (Varnika), Ghanakshari, Rupa Ghanakshari.

MATRIKA : Chaupai, Doha, Soratha, Chaupaiya, Harigitika, Rola, Ullala, (Chappaya), Vira, Sarasi, Savaiya, (Matrika), Kundaliya Radhika.

Paper II—Modern Prose, Drama and History of Hindi Language (50 marks).

A—Modern Prose and Drama.

Books prescribed :—

HARISH CHANDRA : Chandravali.

JAYASHANKAR PRASAD : Ajatashatru.

D. VARMA : Vichardhara—Khoja, Hindi, Sahity, Alochana tatha mishrit (Revised edition).

R. C. SHUKLA : Chintamani, Part I, Essays, 11-17.

SHRI KRISHNA LAL : Hindi Kahaniyan, (Revised edition).

Book recommended :—

GULAB RAI : Hindi Natya Vimarsha.

RAMCHANDRA VARMA : Achchi Hindi.

B—Outlines of the History of Hindi Language.

The following syllabus is prescribed :—

Families of speech ; Indo-Aryan—its history ; place of Hindi in the New Indo-Aryan ; Hindi and its dialects ; Elements in the vocabulary of Hindi ; History of the Devanagari script.

Books recommended :—

DHIRENDRA VARMA : Hindi Bhasha aur Lipi.

GOPAL LAL KHANNA : Hindi Bhasha ka San-
kshipta Itihas.

DHIRENDRA VARMA : Gramina Hindi.

Paper III—Translation from English and
Sanskrit into Hindi and Composition (40
marks).

Urdu

There will be three papers : —

Paper I : Poetry. (Marks 60).

نظم کا کورس

غزلیات

سودا

- (۱) مقذور نہیں اسکی تجلی کے بیاں کا
- (۲) ناوک نے تیرے صید نہ چھوڑا زمانے میں
- (۳) نسیم ہے تیرے کوچہ میں اور صبا بھی ہے
- (۴) سودے کی مردے جسکو تدبیر نظر آئی
- (۵) خاک پر بھی تھرے دیوانے کی یہہ تدبیر ہے

میدر

- (۱) تھا مستعار حسن سے اسکے جو نور تھا
- (۲) الٹی ہو گئیں سب تدبیریں کچھ نہ دوا نے کام کیا
- (۳) مڑھہ تکا ہی کرے ہے جس جس کا
- (۴) اشک آنکھوں میں کب نہیں آتا
- (۵) کچھ موج ہوا بیچاں اے میدر نظر آئی

درد

- (۱) مدرسہ یا دیر تھا یا کعبہ یا بتخانہ تھا
- (۲) مثل تگیں جو ہم سے ہوا کام رہ گیا
- (۳) تجھی کو جویاں جلوہ فرما نہ دیکھا
- (۴) ہم تجھ سے کس ہوس کی فلک جستجو کریں
- (۵) ارض و سما کہاں تری وسعت کو پا سکے

غالب

- (۱) حسن غمزہ کی کشاکش سے چھٹا میدرے بعد
- (۲) یہہ نہ تھی ہماری قسمت جو وصال یار ہوتا
- (۳) کسی کو دیکھے دل کوئی نوا سنج فغاں کیوں ہو ؟
- (۴) عشرت قطرہ ہے دریا میں فلما ہو جانا
- (۵) دیکھنا قسمت کہ آپ اپنے پہ رشک آ جائے ہے

مومن

- (۱) آخر اُمید ہی سے چارۂ حرماں ہوگا
- (۲) ناز بیجا سے سوا شرم کے حاصل نہ ہوا
- (۳) اثر اسکو ذرا نہیں ہوتا

۲

دوق

- (۱) وہ کون ہے جو مجھ پہ تاسف نہیں کرتا
- (۲) اس تپش کا ہے مزہ دل ہی کو حاصل ہوتا
- (۳) عذقا کی طرح خلق سے عزلت گزیر ہوں میں
- (۴) الی کس بیگنہ کو مارا سمجھ کے قاتل نے کشتنی ہے

آتش

- (۱) حباب آسا میں دم بھرتا ہوں تیرے آشنائی کا
- (۲) ہے جب سے دست یار میں ساغر شراب کا
- (۳) مگر اسکو فریب نرگس مستانہ آتا ہے
- (۴) یہہ آرزو تھی تجھے گل کے دو برو کرتے
- (۵) عدم سے جانب ہستی تلاش یار میں آئے

ناسخ

- (۱) کافی بس اسکو نشہ ہے بوئے شراب کا
- (۲) رات ایسا انتظار یار میں بیتاب تھا
- (۳) یہہ نور ہے دے مہ جبین کا کہ ہو خجل چاند چودھویں کا
- (۴) جب سے کہ بتوں سے آشنا ہوں
- (۵) مرا سینہ ہے مشرق آفتاب داغ ہجران کا

امیر

- (۱) یہہ آفتاب ہے گرم اسکی کبریا ئی کا
- (۲) مرے بس میں یا تو یارب وہ ستم شعار ہوتا
- (۳) عالم شگفتہ ہو جو میں آفت رسیدہ ہوں

داغ

- (۱) گر میرے بت ہو شربا کو نہیں دیکھا
- (۲) غضب کیا تیرے وعدہ کا اعتبار کیا
- (۳) عجب ایسا حال ہوتا جو وصال یار ہوتا
- (۴) جلوے مری نگاہ میں کون و مکان کے ہوں

حالی

- (۱) خلوت میں تیرے صوفی گر نور صفا ہوتا
- (۲) پوئیں از ظہور عشق کسی کا نشان نہ تھا
- (۳) سنگ گراں ہے راہ میں تمکین یار کا
- (۴) وحشت میں تھا خیال گل و یاسمن کہاں

حسرت

- (۱) ادا نہ ہم سے ہوا حق تری غلامی کا
- (۲) تجھ کو پاس وفا ذرا ذہ ہوا
- (۳) نہی راحت حیرت کی کس درجہ فراوانی
- (۴) کہن اس نگہ فاز کے قابو میں نہیں ہے
- (۵) نگاہ یار جسے آشنائے راز کرے

عزیز لکھنوی

- (۱) جلوہ دکھلائے جو وہ اپنی خود آرائی کا
- (۲) بہار آتے ہی بدلا رنگ اسہران پر ارماں کا
- (۳) خدا محفوظ رکھے عشق کے جذبات کامل سے

فانی

- (۱) خون ناحق کا گلا تھا کچھ ادب کا جوش تھا
- (۲) مآل سرز غمہائے نہانی دیکھتے جاؤ
- (۳) مانا حجاب دید مری بیخودی ہوئی

جگر

- (۱) کام آخر جذبہ بے اختیار آ ہی گیا
- (۲) تری خوشی سے اگر غم میں بھی خوشی نہ ہوئی
- (۳) سنا ہے حشر میں ایک حسن عالمگیر دیکھینگے

شاد عظیم آبادی

- (۱) غفلت میں ہوئی اوقات بسر اے عمر گریزاں کچھ نہ کیا
- (۲) سراپا سوز ہے اے دل سراپا نور ہو جانا
- (۳) تماؤں میں الجھایا گھا ہوں

ثاقب

- (۱) ہجر کی شب نالہ دل وہ صدا دینے لگے
- (۲) وہی الفت ہے جسکو نشتروں کا کام آتا ہے
- (۳) غلچہ و گل ہین یہہ دو مہمان ہنستے بولتے

صفي

- (۱) نہ وھدی تھا نہ یہدی تھا جلوۂ جانانہ جدا
- (۲) شکرۂ ناکاٹی قسمت بھی کام آھی گیا
- (۳) یہہہ بنخل چشم کرم کو پسند ہو نہ نہ ہو
- (۴) کل ہم آئینے میں رخ کی جھڑیاں دیکھا کئے

نظم طباطبائی

- (۱) اس واسطے عدم کی منزل کو دھونڈھتے ہیں
- (۲) خبر ہوئی خود بخود یہہہ دل کو کہ دھر دارالاسماں نہیں ہے
- (۳) حسن پر خالق خدا لوت گئی

اثر

- (۱) مجھے منزل سے بیگانہ کیا سوداے منزل نے
- (۲) بزم امکان جلوۂ جانانہ سے معمور ہے
- (۳) عشق میں ننگ ہے شرمندۂ درماں ہونا

فضیلات

اقبال

- (۱) فلسفۂ غم
- (۲) زندگی
- (۳) تصویر درد
- (۴) بیداری
- (۵) تعلیم عمل
- (۶) سراغ زندگی
- (۷) لذت خودی

چک بست

- (۱) درد دل
- (۲) نذرانۂ روح

(۳) خاک ہند

(۴) مذہب شاعرانہ

صفی لکھنوی

(۱) ترانہ حمد

(۲) مذاجات

(۳) امید و بھم

نظیر اکبر آبادی

(۱) لے آؤ گدے کو ہاتھ میں اور بار بار دیکھ

(۲) نیکی و بدی دینا

اکبر

(۱) فلک کے سامنے کیا مذہبی بہانہ چلے

(۲) کہیں دل ہوں کہیں میں باعث بیتابئے دل ہوں

(۳) خوشی ہے سب کو کہ آپریشن میں خوب نشتر

یہ چل رہا ہے

مجتہد

(۱) نقاد سے خطاب

(۲) سہاگن بیوہ

(۳) کسان

(۴) پیدا کر

(۵) ربودگی

(۶) بہار آنے لگی

(۷) گرمی اور دیہاتی بازار

حالی

(۱) مرثیہ غالب

(۲) نشاط امید

قصائد

سودا

سنگ کو اذمے لئے کرتا ہے پانی آسمان

ذوق

واہ وا کیا معتدل ہے باغ عالم کی ہوا

مذہب

تجلی پر اگر آ جائے اس کا روے نورانی

امور

سپاہ اشک کی آنکھوں نے کی ہے تھاری

جلال

میں شب کو بند کئے دیدۂ تماشا میں

مشر

دن کت گیا ظاہر ہوئی شام شب ارماں

صفی

پیچ در پیچ ہے شیرازۂ اسباب و علل

مراثی

مراثی میر انیس

(۱) جب قطع کی مسافت شب آفتاب نے

(۲) پھولا شفق سے چرخ پہ جب لالہ زار صبح

مراثی مرزا دبیر

(۱) جب سر نگوں ہوا علم کہکشان شب

(۲) پرچم ہے کس علم کا شعاع آفتاب کی

Paper II—Prose—(Marks 50).

1. SHIBLI : Muaznāe Anees-o-Dabeer.

(۱) شبلی — موازنۂ انیس و دبیر

2. AZAD : Nairange Khyal, Pt. 1.

(۲) آزاد — نیرنگ خیال حصہ اول

3. HALI : Maquddama i-Sher-o-Shairi.

(۳) حالی — مقدمۂ شعر و شاعری

4. DR. ABID HUSAIN : Pardaye Ghaflat.

(۴) عابد حسین — پردۂ غفلت

5. PREM CHAND : Khâk-i-Parwana.

(۵) پریم چند — خاک پروانہ

منتخب مضامین اردو

صفحہ	مضامین	مصنف
۸	لغصب	۱— سر سہد احمد خان
	مداح	
	۱۱۵ سے ۱۲۵ تک	۲— خواجہ الطاف حسین حالی (صفحہ ۱۱۵ سے ۱۲۵ تک)
	شہروں سے بالا اترے (۱۲)	
۹	منقب اور عقل	۳— ڈاکٹر ظہر احمد
	سر سید مرحوم اور	۴— شبلی نعمانی
۱۳	اردو لٹریچر	
۱۲	فلسفہ تصوف	۵— شہر لکھنوی
۱۶	اردو پلچ	۶— چک بست لکھنوی

- ۱۔ منشی سجاد حسین کھلے خط اور سرشتہ
۵ مضامین نمبر ۱
۸۔ نواب سید محمد آزاد یرانی روشنی نامہ و
۶ پیام (لندن)
۷ لیدی کشمر
۹۔ جوالا پرشاد برق
۱۰۔ مولانا محمد علی
۱۱۔ ابوالکلام آزاد
۱۲۔ عبدالحق بانگ درا
۱۳۔ فرحت اللہ بیگ ہم اور ہمارا امتحان
۱۴۔ سلیمان ندوی اردو کھونکر پھدا ہوئی
۱۵

Books to be consulted :—

- (۱) نئے ادبی رجحانات مصنفہ اعجاز حسین
(۲) افسانہ مصنفہ مجنون گورکھپوری
(۳) سہرالمصنفون حصہ دوم مصنفہ محمد یحییٰ قنہا
(۴) روح افسانہ مصنفہ عبدالقادر سروری

Paper III—Translation from English and Simple Persian into Urdu and Composition. (Marks 40).

Mathematics

(Same as for the B.Sc. Examination)

Philosophy

There shall be two papers :—

Paper I—*Modern Philosophy and Psychology.*

Books prescribed :—

1. Rogers : History of Philosophy ;

or

Thilly : History of Philosophy,

or

Alexander : History of Philosophy.

(The following six philosophers only to be studied, Descartes, Spinoza, Leibnitz, Locke, Berkeley and Hume.)

WOODWORTH : Psychology (1940 Ed.)

Paper II—Either (*a*, Elements of Indian Philosophy ;

or

(*b*) Elements of Islamic Philosophy ;

Book recommended : ALI MAHDI KHAN : Elements of Muslim Philosophy.

or

(c) Ethics and Social Philosophy.

Books recommended :

For Ethics :—

PHILLIP WHEELRIGHT : Critical Introduction to Modern Ethics.

or

MUIRHEAD : Elements of Ethics.

For Social Philosophy :—

R. N. KAUL : Social Philosophy for beginners.

The following syllabi are prescribed for
(a) Indian Philosophy, (b) Islamic Philosophy, and
(c) Ethics and Social Philosophy :—

(a) *Elements of Indian Philosophy.*

1. Philosophy of Upanishads.
2. Buddhism and Jainism.
3. Philosophy of Bhagwadgitā.

4. Sāṅkhya and Yoga.
5. Nyāya and Vaisheshika.
6. Vedanta of Shankara and Ramanuja.

Book recommended :

DATTA AND CHATTERJI :—Indian Philosophy,
(New Edition).

(b) *Elements of Islamic Philosophy.*

1. Ancient Indian Greek and Arabic Thought.
2. The Eastern Philosophers : Al-Kindi, Al-Farabi, Ibn-Sina, Al-Ghazali.
3. The Western Philosophers : Ibn Tofai, Ibn Bajja, Ibn Rushd.
4. Development of Sufism : Al-Ghazali, Ibn-al-Arabi, Shruwaady.

(c) *Syllabus for Ethics and Social Philosophy.*

Ethics :

Definition of Ethics. The relation of Ethics to other sciences Its relation to Religion and Philosophy. The psychological background of Ethics. The theories of Freedom. The object of moral judgment. Motives and consequences. Theories of the Moral Ideal :

Intuitionism, Hedonism, Rigorism, Evolutionary Ethics, The End as Common Good, The Ethics of Marx and Nietzsche.

The standard as Relative and Absolute. Ethics as Individual and Social.

Social Philosophy.

Definition and scope of Social Philosophy. What is Human Nature? Development of Social Forms: The Family and Marriage. The Tribe. The Nation and the International State. Social Justice. Education and Society. Property, Feudalism, Capitalism, Fascism, Communism. The Individual and the State.

War and Peace.

The place of Morality and Religion in Human Culture.

Paper II—(Optional).

Note.—Girl candidates have the option of taking Experimental and Child Psychology for Paper II above.

Experimental and Child Psychology.

(1) Laboratory Guide to Experimental Psychology by Collins and Drever.

- 2) TITCHENER : Experimental Psychology.
- (3) 'Child Psychology' by Morgan (Har-
rap).

A study of the books will be accompanied by twelve experiments as recommended by the teacher from year to year. The list of experiments to be done in a given year should be sent to the examiner in advance.

Education.

There will be two papers, either I-A or I-B and II.

Paper I-A.—General and educational psychology for those who have not offered Philosophy along with education for the B. A. Examination).

Book Prescribed :—

WOOD-WORTH : Psychology.

HOLLING-WORTH : Educational Psychology.

CRICHTON-MILLER : The New Psychology and
the Teacher.

Books Recommended :—

MURPHY : Briefer General Psychology.

McDOUGALL : Energies of Men.

SANDIFORD : Educational Psychology.

BUHLER : From Birth to Maturity.

Or

Paper I-B.—Philosophy of Education and Educational Psychology for those who have offered Philosophy along with Education for the B. A. Examination.)

Books Prescribed :—

RUSK : Philosophical Bases of Education.

ROSS : Ground Work of Educational Theory.

HOLLING-WORTH : Educational Psychology.

CRICHTON-MILLER : The New Psychology and the Teacher.

Books Recommended :—

BAGLEY : Educational Values.

HORNE : Idealism in Education.

THOMPSON : A new Philosophy of Education.

SANDIFORD : Educational Psychology.

BUHLER : From Birth to Maturity.

Paper II.—Principles and History of Education.

Books Prescribed :—

RAYMONT : Principles of Education.

GRAVES : Students History of Education.

SEQUIERA : The Education of India.

Books Recommended :—

VAKIL : Education in India.

WELTON : Principles of Education.

NUNN : Education, its data, and First Principles.

BOYD : History of Western Education.

PARANJAPYE : A source of book of Indian Education.

MOHAMAD : History of English Education in India.

Economics

There shall be two papers. The following syllabus is prescribed :—

PAPER I

Pure Economic :

A.—Methodology, with Special reference to Statistical methods :—

Nature, Significance and Scope of Economics. Interrelation with other sciences.

Methods of Investigation. Deduction ; Induction ; Collection ; Classification ; Tabulation and Presentation of Economic Data ; Arithmetic average ; Median ; mode and simple diagrams.

B. — Theory of Value :—

(i) Consumers' Preference.

Wants. Total and Marginal Utility. Diminishing Marginal Utility. Law of Demand and Elasticity. Principle of substitution. Consumers' Surplus.

(ii) Market Prices.

(a) Perfect Competition.

Its Significance. Short and Long Period Prices. Cost of Production and Marginal Utility Theories. Prices in International and Interregional Trade. Joint Demand and Joint Supply.

(b) Monopoly.

Comparison with Competition. Maximum Monopoly and Net Revenue. Price Discrimination 'Elementary Treatment' .

(iii) Marginal Productivity.

Theory of Distribution. Earnings according to Cost and According to surplus.

(a) Surplus or Economic Rent. Pure and Normal profits. Profits under Dynamic Conditions. Quas-rent.

(b) Costs : Wages and Interest. Liquidity Preference. Time Preference. Productivity Theory. Value and Distribution under controlled Economy.

C.—Theory of Production :

Optimum Production. Large-Scale *vs.* Small-Scale Production. Substitution. Increasing, Diminishing and Constant Costs.

D.—Principles of Industrial Organisation :

Joint Stock Principle. Limited Liability. Industrial Combinations. Managing Agency System. Theory of Location. Rationalisation.

E.—Economic Progress and Social Welfare :

Causes. Characteristics of the Capitalist System. State in Relation to Production. Its Deficiencies. Booms and Depressions. Planned Economy. Socialism.

All topics as far possible to be illustration by examples taken for India.

PAPER II

Applied Economics

A. Money, Credit and Foreign Exchange :

Money :—Definition, Functions, Classification. Monetary Standards. Value of Money. Its Measurement and Price Trends. Indian Currency System.

Credit and Banking :—Credit. Credit Instruments. Banks and their Functions Commercial, Industrial and Exchange Banks. Reserve Bank of India. Central Banking Technique. Problems of Industrial and Agricultural Finance. Indian Money and Bill Markets.

Foreign Exchange :—Mechanisms and methods of Foreign payments. Instruments of Exchange. Purchasing Power.

Parity and Balance of Payments Theories of External Value of Money. Rupee—Sterling Exchange Rate. Exchange Control.

B. Trade Inland and Foreign :

A Short History of India's Foreign Trade. Imports. Exports. Balance of Payments. Fiscal and Commercial Policy. Free Trade and Protection. Imperial Preference. Brief Study of Bilateralism. Quotas and Tariffs. Indian Tariff Boards. Inland and Coastal Trade of India.

C. Public Finance :

Revenue :—Classification. Principles of Taxation. Incidence and Impact. Least Aggregate Sacrifice. Progressive and Proportional Taxation.

A Brief Study of Principal Sources of Revenue in India, such as Income Tax, Custom Duties and Excise. Land Revenue. Octroi, etc.

Expenditure :—Classification. Principles of Public Expenditure.

A Brief Study of Principal Heads of Expenditure, such as Defence, Education and Nation-Building Departments in India.

D. Rural and Urban Problems :

Rural Indebtedness. Consolidation of Holdings. Landlord and Tenant Relations. Marketing. A brief study of the growth of the Indian Co-operative Movement. Soil Erosion. Crop Planning. Famines.

Trade Union Organisation. Labour Movement in India. Overcrowding and Town Planning.

Transport: Its Importance Various Means of Transportation in India. Roads *vs.* Railways.

Books prescribed :—

1. TAUSSIG : Principle of Economics.
2. CHAPMAN : Outlines of Political Economy,

or

TODD : Science of Prices.

3. BENHAM : Economics.

4. CHABLANI, H. L. : Indian Currency, Banking and Exchange.
5. JATHAR AND BERI : Indian Economics, Volumes I and II.
6. MEHTA, J. K. : Elements of Economics (selected chapters).
7. DUBEY, D. S. and AGARWAL, S. L. : Simple Diagrams.
8. MALHOTRA, D. K. : History and Problems of Indian Currency 1835-1939.

Books recommended :—

1. MARSHALL : Principles of Economics.
2. HOWARD : Indian Agriculture.
3. The Indian Year Book. (Latest Edition).
4. CARVER : Distribution of Wealth.
5. JAIN : Monetary Problems of India.
6. DALTON : Public Finance (Selected Chapters.)

History

There shall be two papers :—

Paper I—Modern European History.

Books recommended :—

ACTON : Lectures on Modern History, lectures on (1) Luther, (2) Counter-Reformation, (3) Calvin and Henry VIII, (4) Philip II Mary and Elizabeth, (5) Henry IV and Richelieu, (6) Thirty Years' War, (7) Louis XIV, (8) War of the Spanish Succession, (9) Peter the Great, (10) Frederick the Great.

ROBINSON AND BEARD : Development of Modern Europe.

RAMSAY MUIR : New School Atlas of Modern History.

HEARN-HAW : Main Currents of European History in the XIX Century.

RAMSAY MUIR : General History of England.

Note.—No question on the Domestic History of England shall be compulsory.

Paper II—One of the following periods of Indian History :—

(a) Ancient India, 600 B.C. to 1200 A.D.

Books recommended :—

R. S. TRIPATHI :—Ancient History of India.

SMITH, V. A. :—Early History of India (4th edition).

AIYANGAR, S. K. :—Ancient India, Chapter 6.

BHANDARKAR, SIR R. G. :—Peeps into the Early History of India.

MAJUMDAR, R. C. :—Outlines of Ancient Indian History and Civilisation (omitting Book I).

RAY-CHAUDHURI, H. C. :—Political History of Ancient India, 4th Edition.

R. D. BANERJI :—Pre-historic, Ancient and Hindu India.

DR. P. K. ACHARYA :—Elements of Hindu Culture and Sanskrit Civilisation.

(b) Mediæval India, 1200-1707 A.D.

Books recommended :—

ISHWARI PRASAD : History of Mediæval India.

ISHWARI PRASAD : Short History of Muslim Rule in India.

SARKAR : Shivaji and His Times (latest edition).

SARKAR : Mughal Administration.

SARKAR AND DUTT : Modern History of India.

SHARMA : Mughal Rule in India, 2 Vols.

KINCAID AND PARASNIS : History of the Maratha People, Vol. I.

(c) Modern India from 1748 A.D.

Books recommended :—

1. LYALL : Rise and Expansion of British Dominion in India.
2. RAMSAY MUIR : Making of British India.
3. DODWELL : A sketch of the Political History of India (1858-1918).
4. ROBERTS : History of British India.
5. SARKAR AND DUTT : History of India (Modern Period, Pts. I and II).

Politics

There shall be two papers :—

Paper I—General Political theory with special reference to Modern times.

- (a) Theories of the Origin of the State ; Sovereignty ; Rights ; Liberty ; Individualism ; Idealism ; Socialist Theories.
- (b) Plato and Aristotle ; the general trends of political thought in the Middle Ages, as illustrated in the writings of St. Augus-

tine, St. Thomas Aquinas, Dante and Marsiglio of Padua ; the Renaissance and Machiavelli ; the chief ideas of the Reformation period ; Bodin ; Hobbes Locke and Rousseau ; Montesquieu and Burke ; Bentham and J. S. Mill ; Spencer ; Green and Bosanquet.

Books recommended :—

1. DOYLE : History of Political Thought.
2. LORD : Principles of Politics.
3. ILIAS AHMAD : First Principles of Politics.
4. DAVIDSON : Political Thought in England. The Utilitarians. From Bentham to J. S. Mill.
5. BARKER : Political Thought in England from Spencer to Today.
6. JOAD, C. E. M. : Modern Political Theory.
7. GETTLE : History of Political Thought.
8. D. R. BHANDARI : History of European Political Philosophy.

Paper II—Comparative Politics, comprising:

- (a) The Evolution of the State and the Constitutions of England, France and Australia

(b) The Constitution of India.

(c) The Constitutions of the U. S. A. and Switzerland.

Books recommended :—

1. SIDNEY LOW : The Governance of England.
2. BRYCE : Modern Democracies (Switzerland, and the U. S. A.).
3. SAIT : The Government and Politics of France.
4. MUNRO : The Governments of Europe (latest edition).
5. The Government of India Act (latest).
6. STRONG : Modern Political Constitutions.
7. GILCHRIST : Principles of Political Science.
8. RAMSAY MUIR : How Britain is Governed.
9. MACIVER : The Modern State.
10. ILYAS AHMAD : The Machinery of Government.

Geography

The examination shall comprise of two papers and a Practical examination, each carrying 50 marks. Candidates must obtain the minimum pass marks

in the Practical examination, as well as, in the total of the Theory papers separately.

Paper I.

1. A brief introduction to the development of Geographical knowledge.
2. The earth and its Planetary Relations.
3. Weather and Climate. Climatic Types and their distribution.
4. Land forms and their origin.
5. Earth Resources—Water Resources. Biotic Resources, Soils, Mineral Fuels, Ores.
6. Elements of Material Culture—Population. density and distribution, houses and settlements. Agricultural land, pastures, live-stock, fishing, industrial plant, mining, transport.
7. Major geographical regions, and the relative fitness of each to be the home of man.

Books recommended :—

JAMES, P. E. : Outlines of Geography (Ginn & Co.).

DE MARTONNE : A Shorter physical Geography.

BERGSMARK : College Geography (John Wiley).

TARR AND MARTIN : College Physiography (Mac-Millan).

VIDAL DE LA BLACHE : Principles of Human Geography, (Henry Holt).

SAUER, ORTWIN AND LEIGHLY : An Introduction to Geography (Edwards Bros. Ann Arbor).

DEBENHAM : Map Making (Blackie).

DEBENHAM : Exercises in Cartography (Blackie).

DUBEY, R. N. : Physical Basis of Geography.

AHMAD, K. S. : Major Natural Regions.

Paper II.

A detailed knowledge of all aspects of the Geography of the following prescribed areas :—

(i) (a) The British Isles or (b) Europe, excluding British Isles.

(ii) India.

Books recommended :—

LYDE : The Continent of Asia.

DUDLEY STAMP : Asia Methuen.

BERGSMARK : Economic Geography of Asia.

STAMP AND BEAVER : British Isles.

MACKINDER: Britain and British Seas.

Indian Daily Weather Charts (Pub: Meteorological Office, Poona).

DUBEY, R. N. : Economic Geography of India.
Practical Course.

Practical work will consist of:—

Scales of all types, enlargement, reduction and combining of maps and their drawing, and section drawing.

The Cartographic and Diagrammatic representation of Geographical data.

The study and interpretation of topographical and weather maps. Important Map Projections and their construction.

Principles of surveying including an elementary knowledge of the following instruments:—

Prismatic Compass, Plane-Table. Tangent Clinometer and Chain.

Books recommended:—

JAMESON AND ORMSBY : Mathematical Geography Part I.

BYGOTT : Introduction to Map Work
Practical Geography.

WINTERBOTHAM : A Key to Maps.

GARNET, A. : Geographical Interpretation of Topographical Maps.

DUBEY, R. N. : Maps.

BRYANT AND HUGHES : Map Work.

GARNET, A. : A Simple Book of Map Projections.

AHMAD, K. S. : Simple Map Projections.

MILITARY SCIENCE

(For B.A. and B.Sc. Examinations)

Paper I.

1. National Defence including the organization and administration of the Army in India.
2. Principle of war, including Naval and Air Strategy.
3. Economics of war, resources available for war, real and money costs of war, finance of war, taxes, loans, bank credit, effects of blockade and effects of war on economic structure and industrial organization.
4. The military history and allied geography of one of the following campaigns :—

- (a) American Civil War—Shenandoah Valle Campaign—1861-62.
- (b) Palestine Campaign—1914-1917.
- (c) Mesopotamia Campaign—1914-1916 of 1916-1918.

Papea II.

- 1. Military Law, including Indian Army Act.
- 2. Organization of I. T. F.
- 3. Interior Economy and Regimental Duties.
- 4. Choosing and training the recruit, leadership and discipline.

Practical.

- 1. Map reading including contours.
- 2. Weapon training.
- 3. Appreciation, messages and operation orders. Marks assigned :—

Paper I	..	..	..	..	50
Paper II	..	..	..	..	50
Practical	..	..	..	..	50

Total .. 150

Books recommended :—

Manual of Indian Military Law—Government Publication.

Regulations for the Army in India—Govt. Publication.

I. T. F. Act and Regulations—Government Publication.

BARTLETT : Psychology and the Soldier.

SCOTT : Approach to Economics.

WAVELL : Palestine Campaign.

MOBERLY : Official History of the War, Mesopotamia Campaign, Vols. I to IV.

MacMunn : Military Operation, Egypt and Palestine.

KEARSEY : Notes and Lectures on the Campaigning in Mesopotamia.

KEARSEY : Shenandoah Campaign.

COLE : Imperial Geography.

CROWTHER : The Sinews of War (Oxford University Press).

BEVERIDGE : Blockade and the Civil Population (Oxford University Press).

RICHMOND : The Naval Role in Modern Warfare (Oxford University Press).

SHEPHERD : The Military Aeroplane (Oxford University Press).

WAVELL : Generals and Generalship.

DEWING : The Army (National Defence Series published by William Hodge and Co.)

GOSSAGE : The Royal Air Force (National Defence Series published by William Hodge and Co.)

COLE AND PRIESTLY : Outline of British Military History.

LIDDELL HART : Decisive Wars of History.

BOYCOTT : Elements of Imperial Defence.

FALL : Military History of the War in Palestine.

MUSIC

7. The course for the degree examination in Music.

Vocal Music

Theory Sruti, and Svarasthanas of the past and present systems of the South and North : Gita ; Gandharva Gana ; Desi Sangita ; Nibaddha-Anibaddhagana ; Ragalap : Ragalaksana ; Bahutwa,

Alpatwa, Rupkalapa, Alapti : Avirbhava, Tirobhava, Sthayi, svasthana, Mukh chalan, Aksipti, Prachilitalapa Tana, Dhrupad ; Khyal ; Tappa, Thumri, Hori, Ghazal, Tarvana Chaturanga Styles of Singing ; Vagyeyakar ; difference between South and North Tala Paddhati; Sangita Granthas.

Elementary theory of Western Music and Western notation.

Books recommended : —

Hindustani Sangit Kramika Series, Part IV, by Pt. V. N. Bhatkhande, published by V. S. Sukathankar, Solicitor, Malabar Hills, Bombay 2.

Selections from Muarful-naghmat by Raja Nawab Ali, Bhatkhande University, Lucknow.

Gita-Sutra-Sara by Krishnadhan Banerji.

Sangita-Chandrika by Gopeshwar Banerji.

Raga-Vigyan by Prof. V. N. Patwardhan, Gandharva Maha Vidyalaya, Poona.

Talim-Sitar by Prof. Hamid Husain, Marris Music College, Lucknow.

Sitara-marga by S. P. Banerji, Marris College, Lucknow.

Shastra-Pravesha, Part IV.

A Short Historical Survey of the Music of Upper India by Pt. V. N. Bhatkhande, Bhatkhande University, Lucknow.

Tansangraha Parts I & II by S. N. Ratanjankar, Marris Music College, Lucknow.

Sangit of India by Mrs. Atiya Begum, Vila Atya, Ridge Road, Bombay.

Hindustani Music—Its Physics and Æsthetics by Prof. G. S. Ranade, Professor of Physics, Willingdon College, Bombay.

Practical—One slow Khyal and one fast Khyal in each of the following Ragas :—

Shuddha Kalyana, Kamod, Chhayanata, Gaud Saranga, Hindol, Shankara, Deskara, Ramkali Puriyadhanesari, Vasant, Paraj, Puriya, Lalit Gaud-mallar, Miyan-mallar, Adana, Jaunpuri, Shree, Sohani, Kalingara.

Talas—Tritala, Ekatala, Jhapatala, Chautala, Kaharva, Ada-chautala : Rupaka ; Punjabi Theka ; Tilwada, Dadra, Sulaphaka-Tala : Tevra : Jhumara.

7. At least five Dhrupadas and three Dhamars in any one of the Ragas mentioned above.

Instrumental Music

Theory—Same as for vocal music.

Practical—Students will be required to possess a general knowledge of the Ragas prescribed for vocal music. Special attention will be paid to the following ragas :—

Yaman ; Hamira ; Kedara ; Khamaja ; Todi ; Jai-jayavanti ; Vasanta ; Puriya ; Multani ; Malkosa ; Bahara ; Kamoda ; Durga ; Vrindabani saranga ; Miyan-mallar ; Purvi ; Sohani ; Jhinjhoti ; Bilawal Adana.

Students will be required to know the system of tuning the instruments and how to effect simple repairs and the names of important types of musical instruments in India.

Two gats of each raga above to be learned—one Mashit Khani and one Raza-Khani.

Syllabus for the course of Home Arts.

(I) Sociology.

Paper I. Home Economics.

Household Management and Economics.

1. Household Management : Underlying principles, health and economy. Housewife's responsibility for daily marketing and purchase of household supplies, distribution and storages ; menu planning ; providing for care and cleaning of house, training and management of servants, care of children. Par-

ticipation of other members of family in budget making, provision and planning for improvement. Consideration of adjustments needed as India becomes more industrialised.

2. Economics : Family budgets, sources of income and allotment of expenditure between or among various items balancing the budget-maintenance of necessary standards at various economic levels—the child and money management. Consumption: human wants, characteristics of wants, classification. Law of consumption. (Law of demand, law of diminishing utility, law of equi-marginal utility. Engel's law of consumption) ; Relation between spending and saving. Money and credit, money, its functions, different types of money, relation between money and prices, credit instruments, cheques, drafts, bills of exchange-promissory notes. Banks : functions, types of banks in India, saving and investments, avenues for investments, stocks and shares.

Paper II—Psychology with special reference to Child Psychology.

1. Methods and objectives of child study.
2. The relation of child Psychology to General Psychology and Educational Psychology.

3. Infancy—its significance and general characteristics.

4. Heredity—its meaning and significance, Mendelism.

Environment—its meaning and influence home, school and society.

5. Laws of growth—Stages in child life.

6. Instincts—their nature, classification and development. Instinct and habit; imitation and suggestion. Role of play in child development. Theories of Play.

7. Senses and sense training.

8. The emotional life and its development. Conditioning and unconditioning of Emotion.

9. The nature and conditions of attention, Interest and attention.

10. Memory and Imagination. Training in Imagination.

11. Character of Children's Thought. Training in Thinking.

12. Nature of Intelligence. Spearman's Theory-General idea of Binet-Simon Tests.

13. Language and its development.

14. The conative life and its development. Childhood and Habit-formation. Formation of Character.

15. Motor Development, Principles of motor learning.

16. Fatigue and its treatment.

17. Cross-section of the child at different stages.

18. Misdirected tendencies-Children's lies, Introversion, Extroversion.

Rationalisation, Obstinacy, Truancy, Cruelty, Daydream, Delirium, Paranoia, Hysteria, etc.

19. Precocious and Backward children—their education.

Books recommended:—

1. SANDIFORD: The Mental and Physical Life of School Children.

2. NORSWORTHY AND WHITELY: The Psychology of Childhood.

3. MORGAN J. J.: Child Psychology.

4. KIRKPATRICK: Fundamentals of Child Study (new and revised edition).

5. THOM D. A. : Everyday Problems of the Everyday Child (D. Appelton).

Or

PAPER II

Ethics.

A. Cultural and Ethical Development:

1. Education: problem and guidance in the experiences of the child from nursery school, through college.

2. Appreciation of Indian arts and of arts picture of other cultures ; art in the home, use of pictures, picture books, etc., suitable decoration for the home ; principles of costume and design ; art appreciation handicrafts.

3. Music in the home ; brief survey of the history of music ; analysis and illustration of the various forms of musical composition ; development of appreciation and understanding of good music, oriental and western ; suitable records of the great masters pieces, relation of music to personality development.

4. Literature in the home ; study of masterpieces concerning the home ; novels, poems, selection of a library for the home ; special study of

literature suitable for children, creation of stores for Indian children with suitable illustration.

5. Character training in the Home.

B. Sociological Relationships (Advanced).

1. Problems and characteristics of urban and rural life, adjustments of basic needs to social pressures.

2. Social ethics ideals, obligations, community tensions, social actions.

3. The family's responsibility in the development of the community, especially women and civic responsibilities; responsibilities of women whether electors or members with relation to functions of local authorities—municipal boards, district boards, panchayats such as lighting conveyances, education in 'panchayethars' parks, safety, public health, special reference to dispensaries, quarantine, inoculation, cleanliness of streets and markets, pure food, pure water-education committee of domestic relations.

4. Techniques for social work-methods and types of organised effort.

5. The place and responsibility of the Indian community in promotion of successful family life; old ideals and usable Indian pattern—educational

agencies—religious organisation-social and recreational agencies-health promotion institutions occupational opportunities.

6. The nation's responsibility in family development.

7 Family relations as a basic for better world order.

8. Some experience in family and individual case studies, experience in nursery school observation, organisation and direction; school recreation; village health and social work, with practical application of principles from each course incorporated in definite, correlated projects.

(II) Household Arts.

GROUP A

Two Papers.

Paper I. (A) *Principles of Arts and Design.*

A. Introduction to Arts.

B. Art appreciation.

C. Application of Art principles in the Home.

(a) Design—Structural and Decorative.

(b) Harmony—Proportion and Balance in :

1. Furniture and its arrangement.
2. Floor coverings and decoration.
3. Curtains for windows and doors.
4. Accessories :—
 - (i) Pictures.
 - (ii) Books.
 - (iii) Ornaments.
 - (iv) Lamps.
 - (v) Flowers.

(c) Colour principles and applications :—

1. Wall and floor backgrounds.
2. Furniture Textiles.
3. Curtains.
4. Accessories.

(d) Arrangements of various rooms and verandahs.

(e) Planning of a home in view of family requirements.

Practical

1. A colour scheme for a room.

2. Alpana designs for pottery and floors.
3. Flower arrangements.
4. Make :—(a) Removable covers for chairs seats and takhats.
(b) Cushion covers.
(c) Curtains.

Books:—

1. COCKRELL D. B. : Introduction to Art.
2. COLLINS AND RILEY : Art Application.
3. GOLD STEIT H. AND GOLDSTEIN V. :
Art of Everyday Life. Revised
Edition, MacMillan & Co., N. Y.
4. FRANCHEL P. J. : Space for living
creative interior decoration and
design. Double Day Doran & Co.,
N. Y.
5. JACKSON A. : Study of Interior de-
coration. A. Double Day Doran
& Co., N. Y.
6. Alpana. Book available at Shanti
Niketan will be mentioned later on.
7. The Home Lovers Encyclopedia Illus-
trated (1850 illustrations) A ^practical

Guide to all Home Craft, London.
The Amalgamated Press Ltd., Latest,
Edition.

(B) *Household Furnishings.*

I. Application of art principles in the home.

A. Types of design.

1. Realistic.
2. Conventional.
3. Abstract.

B. Principles in design.

1. Harmony.
2. Balance.
3. Rhythm.

C. Colour in interior decoration.

1. Purpose.
2. Types of colour harmonies.
3. Colour transition.

II. Main backgrounds.

- A. Floor coverings.
- B. Wall „
- C. Ceilings.

III. Use of decorative textiles in the home.

- A. Correct selection of fibre and weave for use.
- B. Combining decorative fabrics.
- C. Harmony in design.
- D. Harmony in colour.

IV. Selection and construction of furniture.

- A. Appropriateness for various rooms and uses.
- B. Harmony in design and colour.
- C. Comfort in view of ages of family members.
- D. Renovation of old furniture.
 - 1. Cushions.
 - 2. Slip covers.
 - 3. Upholstering.
 - 4. Finishing and painting.

V. Selection and combination of accessories in the home.

- A. Pictures and photographs.
- B. Small pieces of furniture.

- C. Textiles.
- D. Lamp and lamp shades.
- E. Ornaments.

VI. Planning of homes in view of :

- A. Money available.
- B. Family needs.

VII. Practical guide for furnishing of a home.

- A. Planning.
- B. Buying.
- C. Arranging.

Books recommended :—

1. HESES K. P. : Textile fibres and their use Lippincott, Philadelphia U. S. A.
2. DYER G. E. : Textile fabrics. Houghton Uniffilin, Co. York.
3. FRANHEL P. L. : Space for living, creative interior decoration and design. Doubleday Doran and Co., N. York.
4. DRAPER D. : Decorating and Furnishing. Dcubleday Doran & Co., N. York.

5. JACKSON A. : The study of interior or decoration. Doubleday Doran & Co., N. York.

PAPER II

(a) **Cookery**

I. (a) Normal food.

(b) Infant food.

(c) Invalid food.

(d) Community feeding including :—

(i) Canteens.

(ii) Hotels.

(iii) Hostels.

(iv) Schools.

(v) Hospitals.

II. *Kitchen and its Management* : —

(a) Planning of menu according to balanced diet, shopping for the same.

(b) Kitchen and utensils including washing up and general cleanliness.

(c) Fuel with reference to different types of *chulas*, ovens, and their structure.

(d) Service and disposal.

Practical :—

- (a) Lighting a fire.
- (b) Preparation of vegetables, meat, and fish and spices, etc., for cooking.
- (c) Cooking for principal meals :—
 - 1. (a) Normal food-Rice, Fried Rice, Pullau (vegetable and meat) Puree, Chapati, Paratha, Dals—different preparation of dal.

Practical : —

Rice, Puree, Chapati, Dals – 2 kinds.

Dry Vegetable Dishes :—

Kaddu, Lauki, Sag, potatoes, Bhindi, Arui, Banda, Bringal, Karela, Sam, Cauliflower, Cabbage, Saljam, Mulee, Katahel, etc.

Any two of the above vegetables to be done practically and the receipts of the rest to be supplied.

Mixed Vegetable Dishes :—

Rasadar, Alu Matar, Gobi, Alu Parwal, Alu Cabbage, Alu Tomato Matar, Alu Katehal, Alu Bari, Bengali Lodgepodge with all kinds of vegetable (Charchari.) Chaman (Curd) Curry. Dhoka curry.

Any two of the above vegetables to be done practically and the receipts of the rest to be supplied.

Rayta and Curhees :—Six kinds of recipes out of which 8 only two to be done practically.

Salads :—Four kinds of recipes of which only two to be done in practical.

Chutney :—Six kinds of which only two to be done in practical.

Potato Chips :—Fried Baigun, Fried Vegetables.

How to set Dahi.

Morning and Evening Nashtha :—

1. Samosa, 2. Nimkin and Mitha Sakarpala, 3. Halwa, 4. Sandwiches, 5. Pakowri, 6. One kind of simple cake, 7. Barfi, 8. Dahibara, 9. Chats, 10. Toast, 11. Eggs-half boiled, ponched (boiled and fried) omelette, schumbled eggs.

Four items to be done practically and the recipes to be given for the rest.

Compulsory :—Sharbat, Matha, Lassi, Tea, Coffee, lasan.

Either :—

- Vegetarians. 1. Sandesh.
2. Rasagolla.
3. Lady Caring (Gulabjaman).
4. Chandrapuli & Cocoanut Toff.
5. Suji or Besan Laddu.
6. Motichur or Bundia.
7. Vegetable chops and cutlets.

Compulsory :—

8. Kachauri.
9. Rogni Roti.

Two items of sweets to be done practically and the receipes to be given for the rest.

Or

Meat, Non-Vegetarian—Dry Kabab, Crumb Chops Curry, Roast meat, Ster (Brown), Fish. Fish Moyo-naissee, Fish Mould, Egg Curry.

NOTE :—The following part to be compulsory both for Vegetarians and Non-vegetarians :—

*Puddings :—*Baked Custard, Caramel Custard, Fruit Salad with custard, Mitha Tukra, Zarda, (Mitha Pullau).

Infant :—Humanised Milk, Whey, Barley and Barley water, Vegetables soups, Vegetable smashed and stained through a wire strainer, Irish Stew. Porridge (Milk food).

Invalid food :—Skimmed milk, whey, Barley, and Barley water, Vegetable soups, Vegetable smashed stained through a wire strainer, Irish Stew, porridge (Milk food).

Books Recommended : (Standard books).

1. JOHN HARVEY KELLOG : The New Dietetics. Latest Edn. The Modern Medicine Publishing, Co., Battla Creak, Michigan, U. S. A.

2. GHOSH B. N. : Hygiene and Public Health, (only for chapter on milk, pages 203-218). [Calcutta Scientific Publishing, Co.

Reference Books :

3. J. J. R : Economical Cookery Book for India. Revised Edn. Thacker Spink & Co., Calcutta.

4. Book on Infant Feeding to be mentioned later.

5. Book or notes on Menu for balanced diet to be mentioned later.

6. A book written in Bengali by Acharya Prafulla Ch. Roy can be translated “Khadya Vigyan.”

7. Books or notes on II (b), (c), (d) to be mentioned later.

8. Community Feeding in India, etc., Literature to be mentioned later.

9. American Journals—Better Homes and Gardens.

10. British Journals :—Journal of Decorative Art.

11. Government of India Bulletin No. 23.

12. MASANI M. R. : Your Good.

Or

(b) Textiles.

1. Method of constructing fabrics.

2. Methods of constructing yarn.

3. Finishing, colouring and decorating fabrics.

4. Characteristics of textile fibres :—

(a) Wool, (b) Silk, (c) Cotton, (d) Linen, (e) Synthetic fibre.

5. Selecting fabrics for clothing and household use.

6. Care of fabrics.

(a) Laundering and stain removal.

(b) Dry cleaning.

(c) Protecting from mildew and moth.

Practical

1. Weave sampler on small loom.

2. Make a collection of samples of all available types of fabrics.

3. Spin samples of wool and cotton yarn.

4. Make a collection of various samples showing progress from new fibre to finished yarn.

5. Dry samples of fabrics.

6. Decorate fabrics with block print, batik, stencils, tie dyed.

7. Make tests to identify various textile fibres.

8. Make field trip to bazar to note points in selecting fabrics for various purposes.

9. Laundering methods.

10. Stain removal.

11. Dry cleaning.

12. Storing cloth.

Books recommended :—

1. HESS K. P. : Textile fibres and their use.
Lippencott, Philadelphia,
U. S. A.
2. DYER G. E. : Textile Fabrics.
Houghton Uniffin, Co., N.Y.
3. EVANS AND MCGOWAN: A Guide to Textiles.
John Wiley & Sons, Inc.
N. Y.

Or

GROUP B

Vocal Music

Theory—Samgitā, Nāda, Svara, Suddha and Vkrta, Saptaka, Thāta, Rāga, Alamkāra, Asrayarāga, Vakrasvara, Pakada, Mātrā-Tāla, Odava, Sādava, Sampurua, Purva-rāga, Vilamvita, Madhya and Druta, Uttarakarāga, Sandhi-Prakāsā-rāga, Gunadosa, of the Musician, Suddha, Chhāyā-laga, and Sankirna, rāgas, Graha, Amsa, Nyāsa, Vādi, Samvādi, Anuvādi, Vivādi Alāpa, Tāna, Bolatāna, Dhruvāpada, Khyāla, Tappā, Thumari, Tarrānā, Chaturanga.

A short history of North Indian Music. Reading and writing of Music in simple notation.

Practice—Bilāwala, Yamana, Khamāja, Bhairava, Kāfi, Asāvari, Bhairavi, Bhupāli, Kedāra, Bihāga, Desa, Tilak-Kāmōda, Purvi, Maravā, Todi, Vāgisvari, Bhimpālāsi, Vindāvani Sāranga. Pilu, Mālākosa, Durgā, Kānadā, Jayajayanti, Bahāra, Mulatāni; One Saragama, Laksanagita or Ālāpa and one classical song in each rāga. The student must have a knowledge of the following Tālas :

Tritāla, Ekatāla, Jhapatāla, Dādarā, Chautāla, Kaharavā, Dipachandi, Dhammāra and Tivrā (Teora), Jhumarā.

Or

Instrumental Music

Theory—Same as for vocal music, and a knowledge of the following :—

Gat ; Jhālā, Zamazamā, mind suta, ghasita. todā, parana, bole, tuning of the instruments, etc.

Practice—Students will be required to possess a general knowledge of the rāgas prescribed for vocal music, but special attention will be paid to the rāgas mentioned

below. Students will be required to know the system of tuning the instruments and how to effect simple repairs, the name of the important types of musical instruments in India, and the *easy saragams* and *gats* in the following rāgas—

- | | |
|---------------|------------------|
| 1. Bhimpalāsi | 7. Desa |
| 2. Bhupāli | 8. Tilaka-Kāmōda |
| 3. Bhairava | 9. Vāgisvari |
| 4. Bhairavi | 10. Āsāvārī |
| 5. Kāfi | 11. Kānadā |
| 6. Bihāga | 12. Pilu |

One of the following instruments can be offered for examination:—

Sitāra ; Esrāja ; Harmonium ; Flute ; Violin ; Tabalā or Pakhawāja.

In Tabalā or Pakhawāja, the knowledge of the following Tālas with Thekas and easy Parans will be required :—

- | | |
|------------------------|------------------|
| 1. Tin Tāla or Tritāla | 7. Dhammāra |
| 2. Kaharavā | 8. Dipachandi |
| 3. Ekatāla | 9. Tivrā (Teora) |
| 4. Jhapatāla | 10. Sulphāktāla |
| 5. Chautāla | 11. Jhumarā |
| 6. Dādarā | 12. Adā chowtāla |

*Or***GROUP C****Painting****Practical—1 Year**

- (1) Simple Indian designs and western designs.
 - (2) Linocut.
 - (3) Pottery.
 - (4) Stencilling.
- } Any two of these.

For 1st year women students :

- (1) Simple Indian designs including Alpana.
- (2) Leather work (Batik).
- (3) Embroidery.

Practical—II Year

- (1) Advanced Indian and Western designs.
- (2) Leather work (Barik and Tooling).
- (3) Embroidery.

Theory

- (a) History of Indian Art.
- (b) Art structure and Applied Forms.
- (c) Anatomy.

Books Recommended :

1. PERCY BROWN : Indian Painting. (The Heritage of India Series, Y. M. C. A. Publishing House, 5, Russel Street, Calcutta.)

11. HAROLD SPEED : Drawing and Design.
(for Library only).

(III). Science.

PAPER I

Physiology, Hygiene, Bacteriology and Practical
Physiology.

Basic Principles of Physiology—Cellular constitution of the body, Histological features of a common cell and specialised cell—Chemistry of Cell contents. The constitution of Proteins, fats, lipoids, Carbohydrates and Colloids.

Physiology of Cell membrane.

Reproduction of Cells :

Factors essential to life, importance of osmotic pressure and soluble bodies. H ion and OH ion concentration.

Buffer salts in blood :

Importance of individual inorganic constituents. Importance of temperature. Importance of Oxygen intake and Carbon dioxide. Importance of correct diet. Tissue culture.

Muscular system—General study of muscles, changes in muscles during exercise, chemical changes, fatigue and rigor mortis.

Digestive system—Enzymes, their characteristics and actions.

Secretion of salivary glands and action of saliva. Digestion in stomach, small intestine and large intestine.

Functions of pancreas :

Mastication, Deglutition, Peristalsis and Vomiting. Nervous control and its functions.

Gallbladder and importance of bile.

The Kidney—broad outlines of its anatomy and histology.

The formation and secretion of urine. Diuretics, Composition of normal and pathological urine.

Skin—Structure and functions of the skin. Regulation of body temperature and fever.

Hormones -- Ductless glands—Thyroid, Parathyroid. Thymus, Suprarenal and Pituitary and hormones of ovaries and testes.

The blood—Constituents of blood, Nature of the change of blood, quantity of blood flowing in body and functions of blood.

Circulation — Heart. The course of circulation, Heart beat, pulse, Arterial blood pressure and its maintenance, Haemorrhage.

Spleen and its functions.

Lymphatic—Vessels, glands, flow and the relation of lymph and blood.

Respiratory system—Respiration, gaseous exchange in the lung, artificial respiration, effect of respiratory movements on circulation. Asphyxia Breathlessness or Dyspnoea, Ascent to high altitudes, Mountain sickness and carbon-mono oxide poisoning.

Metabolism—General and basal metabolism, Metabolism of Protein, Fats and Carbohydrates.

Central Nervous system—Nerves and spinal cord, Function of Cerebrum, Cerebellum, Mid Brain, Medulla Oblongata. Pain, Heat and Touch sensations, Vestibular and Postural reflexes.

Effect of Head Rotation, Cerebrospinal fluid, Sleep, intellect.

General outlines of special senses.

Books recommended :

1. Bainbridge and Menzies Physiology—Longman and Greens.

2. Schaffer's Essential Histology—Longman's and Green.

Hygiene.

Preventive medicine and Public Health administration.

Air and Ventilation—Composition of air, changes in the atmosphere due to respiration, combustion smoke, dust and bacteria. Diseases due to the impurities of air. Meaning of ventilation, and the air required for healthy and sick persons, animals and combustion. Natural and artificial ventilation and purification of air.

Houses—Sanitation, floors, roofs, walls, doors, windows, kitchens and drains.

Sanitation and cleanliness—Disposal of refuse, conservancy, water carriage system, traps, valve closet and washdown or Short Hopper closet and through closet Disposal of slop water, sewers, sullage, septic tanks and sewerage.

Water—Composition, quantity of water required for different purposes, Sources of water, Storage. Impurities and purification Slow-sand filters and rapid or mechanical filter.

Personal hygiene and effects of exercise on different system, Dental care.

Infection—Sources, channels of infection, modes of transmission of infections.

Restraint of infection—Notification, isolation, quarantine and disinfection. Antiseptics and disinfectants.

Infection and carriers of infection—Important insects and parasites their anatomy and life history.

Parasitic diseases caused by *Ancylostome doude-nale*, *Ascaris lumbicoidalis*, *Oxyuris vermicularis*. Tape worm, *Dracanculus medinensis* and *Filaria bancrofti*.

Preventible disease—Malaria, Kala-Azar, Plague, Enteric fever, Cholera and dysentery, Diphtheria, Small Pox, Chicken Pox, Measles, Tuberculosis, Mumps. Sarebrospinal meningitis, Influeza, Beri Beri or epidemic dropsy, Leprosy, Rabies, Gram negatice and Spirochaeta Pallida infections.

Prophysaxis of venereal deseases—Ante Natal, Neonatal and post-natal care for mother and infant.

Books recommended :

1. ROBERTSON : An Instruction to Hygiene Butterworth, Calcutta.

2. MODI : Element of Hygiene and Public Health.

3. GHOSH : Hygiene.

4. EGHERT : Personal Hygiene, Butterworth, Calcutta.

5. STEWART : Tropical Hygiene, Thackers.

Bacteriology

Definition of Bacteriology or Microbiology.

Division and differential characterization of Pathogenic Microorganism.

Morphological study of the bacteria.

Physiology of bacteria.

Bacterial enzymes and bacterial toxins.

Principles of immunity including Opsonic index, agglutination, precipitating action, complement fixation, antiviral sera, vaccines and Sera.

Anaphylaxis and Hyper-sensitiveness.

The use of Microscope in Bacteriology.

Use of cultures in the growth of bacteria, general principles only.

Filterable viruses, Bacteriophage and Rickettsia infection.

General study of the causative organism associated with the common suppurative conditions, Pneumonia, Meningitis, Gramnegative diplococci and Spirochaetal infections, Diphtheria, Tuberculosis, Liprosy, Plague, Cholera, Typhoid, Dysentery, Hook worm, Round worm, Thread worm, Tape worm, Guinea worm, Filaria, Malaria, Kala-Azar and Hydrophobia.

Books Recommended :—

1. MACKIE & MACARTY—Bacteriology.

2. SWINGLE D. B.—General Bacteriology,
Published by D. Van
Nostrand & Co., New
York, U. S. A.

3. CONN—GENERAL Bacteriology, MacMillan
& Co.

4. MARSHALL—Micrology, Blackie & Sons.
Practical

1. Outline of the framework of human body. Classification of bones, structure and composition of bones. General Osteology including bones of the skull, spinal column or vertebral column, thorax, upper extremity, Pelvis and lower extremity.

2. Study of models and specimens of different organs and parts of the body.

3. The use of Microscope.

4. Histology of a cell, Human R. B. C. and W. B. C. Identification of Polymorphonuclear cells, small and large lymphocytes, large Mono, Eosinophills, Study of amphibian red blood corpuscle. Epithelium Columnar, squamous, Giliated and Transitional cells, Areolar and Adipose tissues, Elastic and fibrous tissues, Cartilage and bones, Striated and Plain muscles cardiac muscles, Blood vessels, nerves, Lymph glands-spleen and tonsils, Supra-renal, thyroid, Parathyroid and Pituitary.

Skin, Mammary glands, Trachea and lungs, Teeth, tongue salivary glands, stomach, small and large intestine, Liver and Pancreas. Kidney, Ureter, Bladder, and generative organs, Spinal Chord, Meddulla, Pons, Cerebellum and Cerebrum.

5. Preparation and staining of blood slides.
6. Differential blood count.
7. Determination of total R. B. C.
8. Determination of total W. B. C.
9. Determination of Haemoglobin percentage.
10. Identification of Malarial parasites, *Filaria bancrofti*, and L. D. bodies.
11. Preparation of Pus slides and identification of Bacteria.
12. Preparation of sputum slides staining and identification of different bacteria.
13. Pathological examination of Urine (Qualitative.)
14. Quantitative analysis of Sugar and Albumin in Urine.
15. Identification and study of Museum specimens chiefly those of intestinal parasites, *Filaria* and Guinea worm, etc.
16. Demonstration of sanitary fittings.

PAPER II

Elementary Chemistry, Nutrition, Dietetics, and Practical.

Elementary Chemistry and Practical.

Inorganic and Physical Chemistry

Physical and Chemical changes. Mixtures and Compounds—Chemical symbols and formulae—Valency—Calculation of percentage composition, Empirical formula and molecular weight—Chemical equations and their limitations—Laws of chemical combination—Elementary knowledge of atomic theory—Avogadro's hypothesis—Elementary methods for the determination of atomic, equivalent and molecular weights. Acids, bases and salts—Elementary ideas about Catalysis and Catalytic agents—Osmotic pressure.

Preparation, properties and uses of the following elements and their important compounds: Hydrogen, Oxygen, Nitrogen, Carbon and halogens (Cl_2 , Br_2 , and I_2). Sulphur, Sodium, Potassium, Silver, Gold, Iron, and Copper.

Organic Chemistry

Composition, purification and analysis of organic compounds—their separation and purification—Elementary qualitative analysis of Carbon, hydrogen,

nitrogen, and halogens and their quantitative estimation—Deduction of formula from the analysis and molecular weight determination.

Preparation and properties of the following compounds : Methane, Ethane, Ethylene, Acetylene, Methyl chloride, Chloroform, iodoform, Ethyl alcohol, formaldehyde, Ether, Acetone, Acetic and Oxalic acids, benzene, phenol and naphthalene.

Glycerol—Composition of fats and soaps, carbohydrates, reducing sugars, sucrose, starch and cellulose.

Bio-chemistry

Classification of food – composition of Proteins, fats, carbohydrates and elementary ideas about their digestion and metabolism—Elementary ideas about saliva, gastric juice, bile, enzymes and basal metabolism.

Practicals

Complete analysis of a simple inorganic salt soluble in water or HCl by wet and dry methods.

Volumetric : Alkali and acidimetry and oxidation reduction reaction (KMnO_4 – pot. (permanganate)).

Gravimetric : Determination of loss of weight on heating and determination of number of molecules of water of crystallization.

Practical Physiological Chemistry

1. Precipitation and colour reaction of proteins—Tests for glucose and fructose, maltose and sucrose—Hydrolysis of starch by acids—Action of saliva on starch. Tests for milk—Tests for urine and urine report—Tests for urea and uric acid.

Books Recommended :

1. HOLYYARD : Inorganic Chemistry (Arnold).
2. HOLYYARD : Introduction to Organic Chemistry (Arnold).
3. WILLIAMS : Introduction to Bio-Chemistry.
4. PARSON : Fundamentals of Bio-Chemistry.
5. CAMERON : Text-Book of Bio-Chemistry.
6. BRUCE AND HARPER—Practical Chemistry. (Mac.Millan).
7. Cole's Practical Bio-Chemistry.

Nutrition and Dietetics

The Problem of Nutrition.

Principal Food stuffs and their food value—Proteins, Fats and Carbohydrates.

Mineral salts in nutrition.

Vitamins—A, B and B complex, C, D, E, and K and deficiency diseases.

Importance of Water in Nutrition.

Beverages and Condiments.

Proximate principles of diet.

Milk, its composition and suitability as food stuffs for individual for all ages.

Position of Fruits and vegetables in dietary.

Meat diet.

Advantages of mixed diet.

Diets for children, household needs, Boarding houses and invalids also in common deases. Infant feeding and artificial feeding.

Books recommended :

1. CRINCKSHANK E. H. W.—Food and Physical Fitness, Published by Livingstone, London.

2. LUCES NICHOLLS—Tropical Nutrition and Dietetis, Published by Balliera, Tindell and Cox. London.

3. Health Bulcetin No. 23, 1941. The nutrition value of Indian food stuff and planning of satisfactory diet, 3rd edition. Government of India Press.

M. A. Examination**English Literature****M. A. Previous**

There shall be four papers and a *viva voce* test.
Paper I—Poetry (from Chaucer to 1798).

CHAUCER : Prologue to the Canterbury Tales.

SPENSER : The Shepherd's Calendar.

MILTON : Paradise Lost —Books I and II.

DRYDEN : Absalom and Achitophel, Part I.

English Verse, Vol. III (World's Classics
 No. 310).

The following poets are to be read :—Pope,
 Gray, Collins, Goldsmith.

Note.—Unseen passages from texts similar to those
 prescribed in the paper will be set and the question on
 Unseens will carry 30 marks.

Paper II—Drama.

MARLOWE : Doctor Faustus.

MILTON : Samson Agonistes.

DRYDEN : All for Love.

SHERIDAN : The School for Scandal.

BEN JOHNSON : Every Man in his Humour.

SHAW : Arms and the Man.

Books to be consulted :—

WYNNE : Growth of the English Drama.

WARD : English Dramatic Literature.

NICOLL : British Drama.

NICOLL : The Theory of Drama.

NICOLL : The English Theatre.

MORGANN : Tendencies of Modern English Drama.

NICOLL : Readings from British Drama.

Paper III—Prose.

ASCHAM : The Schoolmaster (from the beginning up to and including the paragraph on Lady Jane Grey).

*BACON : Essays on Truth ; Greatness ; Empires ; Delays ; Studies ; Revenge ; Gardens ; Friendship ; Regimen of Health.

*BROWNE : Hydriotaphia, Chapters IV and V.

SWIFT : Selections by Halliday (Macmillan) ; (the prescribed portions are the Battle of the Books, the Bickerstaff Pamphlets, Essay on Conversation, Meditation on a Broomstick).

*ADDISON : Essays edited by Hadow (Clarendon Press).

*LAMB : Essays on the Convalescent ; Christ's Hospital ; Dream-Children ; the Old and New School-master ; My Relations.

RUSKIN : Crown of Wild Glives (War, Peace, Traffic).

MACAULAY : Essay on Addison.

THACKERAY : Lecture on Addison.

*MATTHEW ARNOLD : Culture and Anarchy.

CHESTERTON : Dickens.

**Note.*—Bacon, Browne, Addison, Lamb and Matthew Arnold are for detailed study ; explanation passages will be set only out of them, but critical questions will be set on the whole paper.

Books to be consulted :—

CRAIK : English Prose. The General Introduction to each volume.

Paper IV—Fiction.

SMOLLETT : Humphrey Clinker.

JANE AUSTEN : Pride and Prejudice.

DICKENS : Great Expectations.

THACKERAY : Henry Esmond.

HARDY : Return of the Native.

WALPOLE, H. : A Prelude to Adventure (World's Classics).

Selected Short Stories, 1st Series (World's Classics).

Note.—No question on contexts will be set in this paper.

A *viva voce* examination will be held to test the candidate's knowledge of the course prescribed and the extent of his general reading in relation thereto.

M. A. Final

There will be five papers and a *viva voce* test.

Paper I—Literary and Social History of England.

The following books are recommended :—

GREEN : A Short History of the English People.

GRAVES and HODGE : The Long Week-End.

JUSSERAND : Literary History of the English People.

WALKER : Literature of the Victorian Era.

SAINTSBURY : History of English Literature.

TREVELYAN : History of England.

WILLIAMSON : Evolution of England.

LEGOUIS and CAZAMIAN: History of English Literature. (One-volume edition).

TOWNSEND WARNER: Landmarks in English Industrial History (Blackie).

Note.—Questions on Literature and Social History will be set on all periods beginning from Chaucer.

Paper II—Poetry (from 1798 to the present day)

Books prescribed:—

English Verse, Vols. III, IV and V (World's Classics Series). The authors prescribed are Wordsworth; Coleridge; Shelley; Byron; Keats; Robert Browning; Tennyson; Matthew Arnold; Swinburne; and T. S. Eliot and W. B. Yeats from "Modern Verse" 1900-1940 (World's Classics Series).
Excluding:—

in WORDSWORTH, passages from Michael to the Green Linnet;

in COLERIDGE, passages from "Answer to a Child's Question" to "Love's Apparition";

in SHELLEY, passages from "The Indian Serenade" to "The Sensitive Plant";

in BYRON, passages from "From the Siege of Corinth" to "The Prisoner of Chillon";

in KEATS, "Early Sonnets" and "Isabella or the Pot of Basil";

in ROBERT BROWNING, “ By the Fireside ” and “ The Pied Piper of Hameline ” ;

in TENNYSON, passages from “ From the ‘ Idylls of the King ’ to “ Lucretius ” ;

in MATTHEW ARNOLD, “ Sohrab and Rustum ” and “ The Scholar Gipsy ”.

Unseen passages from the poets of this period will be set. The question will carry 30 marks.

The paper should be divided into two sections, *viz.*, Early XIX Century ; and the Victorians and Post-Victorians ; questions should be compulsory from both sections.

Paper III—Special Subject : SHAKESPEARE

With a detailed study of the following Plays :—

Comedy of Errors ; King Lear ; The Winter’s Tale ; Richard II.

Note.—Unseen passages from Shakespeare and the leading Elizabethan Dramatists will be set. The question will carry 30 marks.

Candidates will also be expected to show a general knowledge of other important plays of Shakespeare, and of the present position of Shakespearean criticism.

The following books are recommended :—

BRADLEY : Shakepearean Tragedy.

DOWDEN : The Mind and Art of Shakespeare.

QUILLER COUCH : Shakespeare's Workmanship.

WILSON : Life in Shakespeare's England.

SIDNEY LEE : Life of Shakespeare.

Shakespeare's England, 2 Volumes.

ALBRIGHT : The Stage of Shakespeare.

CHAMBERS : Shakespeare.

ALEXANDER : The Life and Art of Shakespeare.

A Companion to Shakespeare Studies (C.U.P.).

Paper IV—Essay.

Paper V—Principles of Criticism and History of the English Language.

Book prescribed :—

For Criticism—An Anthology of Critical Statements (Indian Press, Ltd.).

Books recommended :—

RICHARDS : Practical Criticism.

LOWES : Convention and Revolt in Poetry.

JAMES FARRELL : A Note on Literary Criticism.

SCOTT-JAMES : The Making of Literature.

GILBERT MURRAY : The Classical Tradition.

For History of English Language :—

OTTO JESPERSEN : The Growth and Structure of the English Language.

BAUGH : The History of the English Language.

BRADLEY : The Making of English.

TRENCH : The Study of Words (Everyman's Library).

In this paper 60 marks will be allotted to the questions on Criticism and 40 to the Section on Language.

Sanskrit – Previous

There shall be four papers and a *viva voce* test.

Paper I—

(a) The following selections from the Rgveda with Sāyana-Bhāṣya (as in Peterson, Selections of Hymns from the Rgveda First Series, Bombay Sanskrit Series, Vol. XXXVI :—

I. 115 Surya, 154 Viṣṇu ; II. 12 Indra ;
III. 59 Mitra, 61 Uṣas ; V. 83 Parjanya ;
VI. 54 Pūṣan ; VII 49 Āpas, 54
Vāstospati, 68 Āśvins, 83 Indra-Varuna,
86 Varuna ; X. 14 Yama, 90 Puruṣa, 121
Prajāpati, 125 Devisūkta .. 50 marks.

(b) Laghu-Kaumudī upto Ajanta and Sa-
māsa .. 25 marks.

(c) Śisupālavadha of Māgha, Canto I

25 marks.

Paper II—Pāli, Prākṛit and philology :

(a) Jātaka-saṅgraha by N. V. Tungaṛ Oriental Book Agency, Poona.)

(b) Introduction to Prakrit by A. C. Woolner, 3rd edition (Omitting extracts Nos. 6, 8, 12—14, 16—17, 21, 24, 25, 27, 31—33 .

30 marks.

(c) Philology 40 marks.

The scope, division and history (in outline) of the study of language ; general principles of the science of language ; mechanism of speech and classification of sounds with special reference to the history and production of Sanskrit sounds ; classification of languages and families of speech ; the Indo-European family and its general phonetic laws (Grimm's, Verner's and Grassman's) ; brief history of the Sanskrit language from the Vedic stage down to Apabhraṃsa (excluding its further development as Modern Indian languages).

Books recommended :—

JESPERSON, O. : Language—Books I and IV.

BLOOMFIELD, L. : Language.

GUNE, P. D. : Introduction to Comparative Philology, pp. I—222.

WHITNEY, W. D. : Sanskrit Grammar.

UHLENBECK, C. C. : Sanskrit Phonetics.

GRAFF : Language and Languages.

TARAPOREWALA : Elements of the Science of Language (Calcutta University).

Sāmānya-Bhāṣā-Vijñāna by Dr. B. R. Saksena.

Paper III—Indian Philosophy :

(a) Tarkabhāṣā of Kṛṣṇa Misra.

(b) Sāṅkhya-tattva-kaumudī.

(c) Vedāntasāra of Sadānanda.

Paper IV—Cultural and Literary History of Ancient, India.

(a) Cultural History of India with outlines of the political events in Ancient India.

Books recommended :—

1. Imperial Gazetteer of India. Vol. II, Chapters I-IX.

2. R. S. TRIPATHI : History of Ancient India.

3. SMITH, VINCENT A. : Early History of India 4th edition.

4. MACDONELL, A.A. : India's Past.

5. P. K. ACHARYA : Elements of Hindu Cul-

ture and Sanskrit Civilization.

6. R. D. BANERJĪ : Prehistoric, Ancient and Hindu India.

(b) History of Sanskrit Literature—(Marks 50).
Books recommended :—

WINTERNITZ : History of Indian Literature,
Vols. I & II.

KEITH : History of Sanskrit Literature and
Sanskrit Drama.

In papers I, II and III, questions will be set demanding a knowledge of the history of the branches of literature represented by the text-books.

N.B.—1. The questions shall be distributed over all the books prescribed as far as possible and no undue predominance shall be given to any particular book.

2. Sanskrit must be written in the Deva-nāgarī characters.

SANSKRIT—FINAL

Candidates will be required to offer only one of the following groups.

There shall be four papers and a *viva voce* test for each group.

The papers will be set on text-books in each group. A fourth paper on Composition will be common for all groups.

In each of these three papers, questions will be set demanding a knowledge of the history of the branches of literature represented by the text-books.

The questions shall be distributed over all the books prescribed as far as possible and no undue predominance shall be given to any particular book.

Sanskrit must be written in the Devanāgarī characters.

Group A—Vedic Language and Literature

Paper I—

- (a) R̥gveda-saṁhitā, Maṇḍala V and Maṇḍala X (Hymns 1-29).
- (b) Aitareya Brāhmaṇa, Pañcikās I—III (Ānand-āsr̥ma Series, Vol. XXXII, Part I).

Books recommended:—

- 1. MACDONELL: Vedic Grammar for Students.
- 2. WINTERNITZ: History of Indian Literature Vol. I, Part I.

Paper II—

- (a) Mādhyandina Saṁhitā, Chapters I and II.
- (b) Śatapatha Brāhmaṇa, Chapter (Kāṇḍa) I.

- (c) Mandana Misra—Mimāṃsānukramanikā,
Chapters I-III.

Paper III—

(a) Rkprātisākhya—Patalas I—XV.

(b) Nirukta—Chapters I—III.

(c) Yasna IX, XXIX, XXX.

2. Behistun Inscription of Darius, Column I
(Ancient Persian).

(d) General comparison between Sanskrit and
Old Iranian in Phonology and Morpho-
logy.

Books recommended :—

GUNE, P. D. : Introduction to Comparative
Philology, Pages 116-130.

JACKSON, A. V. W. : Avesta Grammar.

JHONSON, E. L. : Historical Grammar of the
Ancient Persian Language.

Paper IV—Composition.

N.B.—Questions on Vedic Religion and Mythology will
be distributed over Papers I and II.

Group B—Sanskrit Language and Literature

Paper I—(a) Kāvya prakāśa ... 75 marks.

(b) Kādambari (Purvabhāga) 25 marks.

Paper II—(a) Dāsarūpaka with Avaloka 40 marks.

(b) $\left\{ \begin{array}{l} \text{Ratnāvalī.} \\ \text{Svapnavāsavadatta.} \\ \text{Venīsamhāra.} \\ \text{Śākuntala.} \end{array} \right\} \dots 60 \text{ marks.}$

Paper III—

- (i) Naisadhiyacarita (Cantos I—III) 25 marks.
- (ii) Śisupālavadha (Cantos XIV, XV, XVII and XX) ... 25 marks.
- (iii) Vṛttaratnākara (omitting Chapter VI) and versification ... 25 marks.
- (iv) (a) Mahābhāṣya (Āhnika I)
- (b) Laghu-Kaumudī—Halanta, Kṛdanta, Taddhita, and Stripratyaya ... 25 marks.

Books recommended :—

1. KEITH, A. B. : History of Sanskrit Literature.
2. KEITH, A. B. : Sanskrit Drama.
3. MM. P. V. KANE : History of Alankāra Literature.

Paper IV—Composition.

N.B.—Questions on the history of Sanskrit literature will be distributed over Papers I—III.

Group C—Dharmaśāstra

Paper I—

(a) JAIMINI : Mīmāṃsā-sūtras with Śabara-bhāṣya, Adh. I, Pāda I.

(b) MANDANA MĪSRA : Mīmāṃsānukramanikā, Ch. I—III.

(c) KUMĀRILA BHATTA : Tantra-vārtika, Smṛti-pāda.

Paper II—

1. YĀJÑAVALKYA : Yājñavalkya-smṛti with Mitākṣarā on Vyavahārādhyāya.

2. MANU : Mānavadharmasāstra.

Paper III—

1. KĀTYĀYANA : Śraūta-sūtra—Section on Darsapaurṇamāsa

2. PĀRASKARA : Grhya-sūtra.

3. ĀPASTAMBA : Dharma-sūtra.

Books recommended :—

BÜHLER : Sacred Laws of the Aryas and Institutes of Manu (S. B. E., Vols. II, XIV, and XV, Introductions only).

2. OLDENBERG : The Gr̥hyasūtras (S. B. E. XXIX and XXX, Introductions only).

3. JOLLY : Tagore Law Lectures (Lecture I .

4. POLLOCK (Editor) : Maine's Ancient Law.

5. DR. GANGANATHA JHA : Prābhākara School of Pūrva Mimāṃsā.

6. P. V. KANE : History of Dharmasāstra Vol. I.

7. JOLLY, J. : Indian Laws and Customs.

8. DR. GANGANATHA JHA : Hindu Law in its Sources, Vols. I—II.

Paper IV—Composition.

Group D—Philosophy

Paper I—

1. GAUTAMA : Nyāyasūtra with Vātsyāyana Bhāṣya, Chapter I.

2. Nyāya-Siddhānta-Muktāvalī (Pratyakṣa and Śabda Khaṇḍas).

3. Prasastapāda-Bhāṣya (Dravya Section only).

Paper II—

1. Yogasūtras with Vyāsa-bhāṣya.
2. Māṇḍukya-Upaniṣad with Gauḍapāda's Kārikā.
3. Bodhicaryāvatāra, Chapter IX (Prajñā-pāramitā).

Paper III—

1. Brahmasūtra with Śāṅkara-Bhāṣya.

Adhyāya I.—

- (i) 1-4, 12-19.
- (ii) 9-12.
- (iii) 8-9, 26-33.
- (iv) 1-7, 19 28.

Adhyāya II.—

- (i) 1-3, 11, 14, 18, 32-37.
- (ii) 1-45 (whole).
- (iii) 14, 17-18, 43-53.
- (iv) 20-22.

Adhyāya III.—

- (i) 1-27 (whole).
- (ii) 1-10, 38-41.
- (iii) 1-5, 9, 16, 17, 25, 27-28, 32, 34, 53-54.

(iv) 1-20, 26-39, 47-52.

Adhyāya IV.—

(i) 1-3, 12-15, 18-19.

(ii) 1-2, 7-16, 20-21.

(iii) 7-14.

(iv) 1-22 (whole).

2. Pāncadāsī (I-VII).

Books recommended:—

1. Outlines of Indian Philosophy by M. Hiriyanna.

(2) Conception of Matter by Dr. Umesh Mishra.

(3) Buddhist Philosophy by A. B. Keith.

Paper IV—Composition.

Group E—Epigraphy and Palaeography

Paper I—

Asoka Inscriptions.

History of the Northern Indian Alphabets with Special reference to Brāhmī and its derivatives.

Books recommended:—

HÜLTZSCH, E. : Corpus Inscriptionum Indicarum Vol. I.

BÜHLER, G. : Indian Palæography (English Version).

BUHLER, G. : Origin of the Indian Brāhmī Alphabet.

GAURISHANKARA H. OJHA : Prācīnalipimālā.

Paper II—

Gupta Inscriptions.

The origin and use of the Vikrama and Śaka eras.

Books recommended :—

Corpus Inscriptionum Indicarum, Vol. III, by Fleet.

Indian Antiquary, Vols. XIX-XX, XXII—XXVI.

SEWELL AND DIKSIT : Indian Calendar, Section I (dealing with Indian Calendar Terms).

Bhandarkar Commemoration Volume.

Paper III—Early History of India (600 B. C. to 1200 A. D.) with special reference to the Maurya, Kuṣāṇa and Gupta periods.

Books recommended :—

SMITH : Early History of India, 4th edition

RHYS DAVIDS : Buddhist India.

YUAN CHWANG : Travels in India (Edited by Watters).

STEIN, M. A. : Kalhana's Rājatarāṅgiṇi, Vol. I, Introduction.

Cambridge History of India, Vol. I.

RAYCHAUDHURI, H. C. : Political History of Ancient India, 4th edition.

BHANDARKAR, D. R. : Carmichael Lectures (First Series).

For all papers—Chapters I—VI of the Imperial Gazetteer of India, Vol. II.

Paper IV—Composition.

Group F—Pali and Prakrit

Paper I—Pāli Texts :

1. Bhikkhu-pātimokkha (ed. Vidhushekhara Sastri, Calcutta).

2. Mahāparinivvāna-Sutta.

3. Suttanipāta—Uragavaggo, Cullavaggo and Mahāvaggo.

4. Milindapañho—pp. 1—92 (ed. Vadekar, Bombay).

5. Āsoka Inscriptions : 14 Rock Edicts and Calcutta-Bairat (Bhabru) Edict.

Paper II—Jain Prakrit Texts :

1. Āyāraṅga-Sutta, Part I.

2. Uttarājñhāyana-Sutta, I—IX.

3. Uvāśagadasāo (Adhyāyas I and II).
4. Davvasaṅgaha.

Paper III – Literary Prakrit Texts :

1. Karpūramañjarī.
2. Gāhāsattasāi, Centuries I—III.
3. Setubandha, Cantos I—IV.
4. Jasaharacariu, I—II (Karanja Jain Series, Vol. I).

Books recommended :—

- (a) (1) MULLER : Simplified Pāli Grammar.
- (2) MOGGALLĀNA : Pālivyākaraṇa.
- (3) VARARUCI : Prākṛtaprakāśa.
- (4) HEMACANDRA : Prakrit Grammar (Portion dealing with Jaina Prakrits).
- (5) P. L. VAIDYA : Ardha-māgadhī Grammar.
- (6) A. C. WOOLNER : Introduction to Prakrit.
- (b) (1) MRS. RHYS DAVIDS : Buddhism.
- (2) KERN : Manual of Indian Buddhism.
- (3) STEVENSON : Heart of Jainism.

(4) Articles on Buddhism and Jainism in the Encyclopædia of Religion and Ethics.

(5) Articles on Pāli and Prakrit in the Encyclopædia Britannica.

(6) E. J. THOMAS : History of Buddhist Thought.

(7) B. C. LAW : History of Pāli Literature.

Paper IV—Composition.

Arabic—Previous

There shall be four papers, each carrying 100 marks, and a *viva voce* test of 100 marks.

Paper I—

Prose	100 marks
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Paper II—

Poetry	100 „
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Paper III—

(a) History of Literature		70	} 100 „
(b) Principles of Criticism		30	

Paper IV -

(a) Translation	..	60	} 100 „
(b) Grammar	..	40	

Prescribed Course :—

Paper I—Prose—(1) the *Maqamat* of Al-Hariri, up to the end of the Tenth Maqamah. (2) *الكامل* of al-Mubarrad, Vol, II (باب الخوارج), pp-119-170, according to the Selections published by Jan Muhammad (Kashmiri Bazar, Lahore).

Paper II—Poetry (1) *Diwan al-Hamasah. Babu' l-Hamasah*, from the poem of Sulma b. Rabia 'b beginning :

حلت تماضر غربته فاحذلت — فلهجا واهلك بالملوي فالهتته

to the end of the Bab, and *Bab-al-Marathi* up to the end including the poem by 'Aji al-Saluli, ending with the verse :

إذا يزل الاضفاف كان عذورا — علي الهدي حتي تستقل . راجله

(2) The *Mu'alloqat* of Imrau'l-Qays, Labid and 'Antarah.

Paper III—(a) History of Literature. (70 marks).
Books recommended :—

(1) R. A. NICHOLSON : *Literary History of the Arabs*.

(2) C. HUART : *History of Arabic Literature*.

(3) Ahmad Al-Iskandari and Mustafa : *Al-Wasit*—

(b) Principles of criticism : (30 marks).

Book prescribed : (1) قدامة بن جعفر of الفقد في الشعراء as edited and annotated by S. Asghar Husain in his work entitled عقد السحر في عرج فقد الشعر (available from S Abbas Ali Rizavi, Madrasa-i-Nazimiyya, Lucknow).

(2) Introduction to جمهرة أشعار العرب by Al-Qurashi

Paper IV—Translation from Arabic into English and *vice versa*; and Grammar.

A *viva voce* test.

Arabic—Final

There shall be four papers, each carrying 100 marks, and a *viva voce* test of 100 marks.

Paper I—Poetry :—

Books prescribed :—

(1) نابغة الذبياني ديوان from the beginning upto the end of قافية الراء

(2) ديوان حسان بن ثابت : the *qasidahs* beginning with

(1) عفت ذات الاصابع فالجواء

(2) لعمرو ابيك يا شعث مرانبا

(3) نبلت فوادك في المقام خريدة

(٣) الم تستل الربع الجديد التكلما

(٥) مذبذوم الذوم بالعشاء الهموم

(٦) لك التخير غضي الذوم عذي فانذي

قافية اللال و قافية الاء — ديوان المتلبي (3)

excluding the *qasidah* opening with, ما انصف البوم ضبه

Paper II—Any two of the following :—

(a) Prose—

Books prescribed :—

(1) The *Rasa'il* of Badi'uz Zamān al-Hanadhāni entitled the *Kashful-Ma'ani wal-Bayan 'an Rasa'il-iBadi-iZ-Zaman*, Catholic Press, Beyrout 1921, pages 28-84, both included.

(2) *Rasai' ul-Bulagha* (ed. by M. Kurd Ali Cairo 1913, *Al-Qism al-Thani*), p. 176 to the end.

(b) History of Islam—

One of the following periods :—

(i) Early Islamic Period, comprising the Sirah and the reigns of the first four Caliphs.

(ii) The Umayyad period (Eastern).

(iii) The Umayyad period (Western).

(i) The Abbasid period.

Books recommended :—

- (1) The *Chronicles* of Tabari.
- (2) The *Kamil* of Ibn al-Athir.
- (3) AMIR ALI, *A History of the Saracens*.
- (4) AMIR ALI, *The Spirit of Islam*.
- (5) Hell's *Arab Civilization*, translated by S. Khuda Baksh.
- (6) PHILIP K. HITTI : *A History of the Arabs* (MacMillan).

(c) History of the Arabs in India—

Books recommended :—

- (1) Al Baladhuri, *Futuhu'l Buldan*.
- (2) Al Biruni, *Kitab al-Hind*.
- (3) The *Rihlab* of Ibn Battutah.

(d) Comparative philology of the Semitic languages—

Book recommended :—

W. Wright, *Comparative Grammar of the Semitic Languages*.

(e) Logic and Metaphysics—

Books recommended :

- (1) *At-Tasawwurat*, Qadi Mubarak.
- (2) *At-Tsadigat*, as contained in the *Hamdullah*.

(3) *Sadra*, up to the discourse on *Al-Muthannat bi't-takrir*.

(f) Tafsir—

Commentary on the Qur'an. Al-Juz' alwwal, as contained in either the *Baydwi* or the *Jami' ul-Jawam'* of Tabrisi.

(g) Hadith—

Books recommended :—

Either—Sabibu'l Bukhari: Kitabu's-Sulh, Kitabu't-Tafsir and Kitabu'l-Adab; and the corresponding Books of *Sabih Muslim*.

Or, Al Usul fi'l Kafi; Kitabu't-Tawhid and Kitabu'l-Iman.

(b) Muslim Law—

Kitabu'n Nikah, Kitabu't-Talaq, Kitabush-Shuf'ah, Kitabu'l-Bay', Kitabu'l-Waqf, as contained in either the *Hidayah*, or the *Shari'ul-Islam*.

(i) Tasawwuf—

Books recommended :—

(1) *A.-Risalat al-Qushayriyya*, Chapters on :—

تفسير الفاظ تدور بين هذه الطوائف، التصوف، التوحيد
المعرفة بالله، المحبت الشوق، الوصية بالمريدين

(2) *Iryau'l'Ulum* of Al-Ghazzali, Chapters on :—

بيان حقيقة اللمعة ، الكتاب في الروح ، كتاب التوحيد
والتوكل الشواهد الشريعة في محبة عبد الله ، القول في المعني
رضا بالقضاء

Paper IV—Essay in Arabic on a subject connected with Arabic literature or culture.

A *viva voce* test on the subjects offered for the first three papers.

Persian—Previous

There shall be four papers, each carrying 100 marks, and a *viva voce* test of 100 marks.

Paper I—	(a) Prose	..	80	} 100 marks.
	(b) Elementary Arabic	..	20	

Paper II—	(a) Poetry	..	90	} 100 marks.
	(b) Rhetorics and Prosody	..	10	
		..	10	

Paper III—	(a) History of Literature	..	70	} 100 marks.
	(b) Principles of Criticism	..	30	
		..	30	

Paper IV	Ethics and Politics	..	100 marks.
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Prescribed course—

Paper I (Prose) :—

(1) *Maqamat-i-Hamidi* : Maqamas 4, 7 and 9.

(2) *Tawqi'at-i-Kisra* (ed. by Mr. Rehman) first 20 *Tawqi'at*.

(3) *A'inab-i-danish* (ed. by Dr. Muhammad Iqbal) : Prose Selections.

(4) *Darajatu-'l-'Arab* Part I, with Arabic Grammar : forms of Nouns, conjugation of strong verbs from simple triliterals.

Paper II—Qasidas of the following Poets :—

(i) Khaqani, published by the Anwarulmatabi', Lucknow, beginning with :—

- (۱) سنت عشاق چیست برگ عدم ساختن
- (۲) عید است و پیدش از صبح دم مژده بخمار آمد
- (۳) قحط وفاست در بند آخر الزمان
- (۴) مر صبح پای صبر بدامن در آورم

(ii) The *Qasidas* (as contained in the *Qasaid-i-Zahir-i-Faryabi*, published by Nawal Kishor., Lucknow, 1913, beginning with the lines :—

- (۱) - نشست حشر و روی رمین به استعشق
- (۲) - چو ماه یکشنبه بذهبت چهره از نظرم
- (۳) - شهی که ملک تفاخر کند به گوهر او
- (۴) - نباشدت نفسی در سر از گله داری
- (۵) - کراست زهره که با این دلی ز صبر نفور
- (۶) - ز خواب خوش چو برانگیخت عزم مهدانش
- (۷) - ای حکم تو چون قضای مبرم

(۸) - ای قصر عرش را ز معالیت کذگره

(۹) - ای ز کرم مدام ده کام مراد ایس دلم

(iii) 'Urfi, beginning with :—

(۱) اے متاع درد در بازار جان انداخته

(۲) اے مرتفع ز نسبت ذات تو شان علم

(۳) سپیده دم چو زدم آستین بهشمع شعور

(۴) دل من باغبان عشق و حیرانی گلستان

(۵) چهره برداز جهان رخت کشد چون به حمل

(۶) هر سوخته جانی که به کشمیر در آید

Questions involving literary criticism will be set in Papers I and II.

Paper III—(a) History of Persian Language and Literature—Book recommended :

E. G. Browne, *Literary History of Persia*, Vols. I, II and III.

(i) Shairani, M., *Tanqid-i-Shi'ru'l 'Ajam* (published by the Anjuman-e-Tarraqi-e-Urdu, Delhi).

(ii) Shairani, M., *Firdausi par Char Maqde* (Published by the Anjuman-e-Tarraqi-e-Urdu, Delhi).

(b) Principles of Criticism :—

Books prescribed :

(1) Introduction to *Al-Bulabab* of 'Awfi.

(2) Shibli *Shur al-'Ajam* Vols. IV and V.

Note.—A knowledge of the outlines of the political history of Iran will be expected of the candidates, for which P. Syke's *History of Persia* (Students' edition) is recommended.

Paper IV—Ethics and Politics.

(1) Tahdhib-i-Nafs from the *Akblaq-i-Nasiri*.

(2) Siyasati-i-Mudan from the *Akblaq-i-Jalali*.

A *viva voce* test :—

Note.—Students are required to have such knowledge of the Etymology of Arabic language as will enable them to explain all Arabic words and phrases which may occur in Persian texts.

Persian—Final

There shall be four papers, each carrying 100 marks and a *viva voce* test of 100 marks.

Paper I. (a) Poetry ... 80 marks
(b) Rhetorics and Prosody ... 20 marks.

Books prescribed for (a) :—

(1) *Qasaid-i-Ghalib*. The following qasidas :—

(۱) آن بلبلے کہ در چمنستان بشاخسار

(۲) صبحی کہ در هوای پرستادی و تن

(۳) در دورگاہا نتواند شمار یافت

(2) *Qas'id-i-Qa'ani*, published by the University of the Punjab. First 25 Qasidas.

(3) *آئینہ دانش* (ed. by Dr. M. Iqbal) :

Poetry selections as follows: the *qasa'id* of 'Uususi, Nasir-i-Khuoraw, Abu'l-Faraj Runi and Rashid Watwāt.

Books recommended for (c) :—

- (1) *Hada'iqul-Balaghat*.
- (2) *Mi'yarul-Ash'ar*.
- (3) Shams Qays : *Al-Mu'jam fi Ma'ayir-i-Asha'ril-'Ajam*.
- (4) Asghhar 'Ali Ruhi: *Dabir-i-'Ajam* (Lahore 1930).

Paper II—Prose—(a) Persian Prose .. 80 marks.
 (b) Elementary Arabic .. 20 marks.

Books prescribed for (a) :—

- (1) شيدم شادب (ed. Mr. M. N. Rehman, (2) Dafter III, First half (3) هما by Mir Muhammad Hijāzi, published by Ram Narain Lal, Allahabad, (4) درجات اللادب Paper II with Arabic Grammar: Forms of conjugations of strong verbs from enhanced Triliterals (First 8 only) and the مائة عامل

Paper III.—Special study of one of the following groups, to be selected by the Head of the Department at the beginning of the session.

(a) Poetry.

Books prescribed :—

(i) Hāfiz, *Diwan*, Radif *Dal*, from Ghazal No. 115 to 200 (both included), as contained in the Calcutta edition by H. S. Jarret.

(ii) Mawlānā Rum, *Mathnawi*, from the beginning up to :

سالها تو سنگ بودي دلخواش
آزمون را يك زماني خاک باش

(b) Introduction to Iranian Philology—

Books recommended :—

(i) *Gurndriss der Iranischen Philologie*, Vol. I, Part II, first 191 pages.

(ii) Huebschmann's *Persische Studien*, Part II, dealing with phonology.

(c) History of Islam :—

(i) The Prophet and the first four Caliphs.

(ii) *Either* the period of the Umayyads, *or* that of the Abbasids up to the reign of Al-Mutawakkil (as given in the *Rawdatu's-Safā* *or* *Habibuts-Siyar*) and the Persian translation of the *Chronicles* of Tabari, and Amir Ali's *History of the Saracens*.

(d) Philosophy with special knowledge of
Sūfism :—

Books recommended :—

(i) Al Ghazzālī, Ki, *Kimiya-i-Sa'adat*.

(ii) *Akhlāq-i-Jalālī*, omitting the discourse
on *Naghma*.

Paper IV —Essay in Persian on a subject
connected with Persian literature or culture.

A *viva voce* test on the subjects offered for the
first three papers.

Note.—Students are required to have such knowledge
of the etymology of the Arabic language as will enable them
to explain all Arabic words and phrases which may occur in
the Persian texts.

Hindi—Previous

There shall be four papers and a *viva voce* test.

Paper I—Poetry: Charan, Sant and Prem Kavya.

NARPATI NALHA : Bisaldev Raso.

DIKSHIT AND TIWARI : Virakavya Sangraha
(Chand, Gorelal, Sudan, Jodhraj.)

PRITHVIRAJ : Veli Krishna Rukmani ri.

Kabir Granthavali (N. P. Sabha, Benares).

Sakhi—from Gurudeva kau Anga to Chita-

van kau Anga; Maya kau Anga ; Sabad kau Anga.

Pada—1—31, 258—268, 398—410.

Santabani Sangrah, Parts I and II (Belvedere Press, Allahabad).

The following poets are prescribed :—

Guru Nanak, Dadu Dayal, Sundardas, Jagjiwan Saheb, Dariya Saheb (Biharwale), Bulle Shah, Shahjo Bai, Garibdas and Tulsi Saheb.

JAYASI: Padmawat (up to Shatritu Varnana).

Books recommended for reference :—

GANESH PRASAD DWIVEDI: Hindi ke Kavi aur Kavya, Parts I and II.

P. D. BARTH WAL: Nirgun School of Hindi Poetry

K. M. SEN: Mediæval Mysticism of India.

VICHARDAS: Bijak.

HAZARI PRASAD DWIVEDI: Kabir.

Sundar Granthavali, Parts I and II.

Paper II—Special study of *one* of the following authors :—

Surdas, Tulsidas, Keshava and Prasad.

Paper III—Poetics, Prosody and Dramaturgy, including Principles of Modern Criticism.

A. Poetics, Prosody and Dramaturgy.

The following syllabus is prescribed :—

(i) Kavya-Lakshana, Bheda ; Padārtha Nirṇaya (Abheda, Lakshana, Vyanjana ; Dhvani Bheda ; Alankar, (Shabdāṅkar, Arthāṅkar, Chitrāṅkar ; Samanyāṅkar) ; Gun ; Tuk Nirṇaya ; Dosh ; Rasāṅga Varnana.

(ii) Chhanda Śāstra ka Itihāsa, Chhanda aur, Sāṅgita, Prastāra ka Samānya Parichaya, Hindi Chhanda Śāstra ka vikaś.

(iii) Nāṭya Lakshana ; Rūpaka and Uparūpaka their types ; Purvarāṅga and Prastāvana, Vastu ; Avastha ; Sandhi ; Nishēdha ; Arthopashēpaka ; Bhasana, its types Prakāśha, Swagat, Janāntika, Apvarita Akāśhbhasita ; Nāyaka, his qualities and kind ; Nāyaka Sahāyaka ; Nāyika, her qualities and kinds ; Bhāva and Hāva ; Rasa and its constituents ; Vṛitti.

Books recommended for reference :—

KESHAVA : Kavipriya.

DAS : Kavya Nirnaya.

R. C. SHUKLA : Chintamani, Part II.

PRASAD : Kavya aur Kala.

SURYA KANT SHASTRI : Sabitya Mimansa.

MATIRAM : Rasraj.

BHANU : Chhand Prabhakar.

PODDAR : Kavya Kalpadrum

GOLAB RAI : Siddhanta aur Adhyayana.

SHYAM SUNDER DAS : Rupak Rahasya.

RAMA SHANKAR SHUKLA : Alankar Piyusha, Parts
I & II.

Kavya Prakash (Hindi translation by Hari
Mangal Mishra).

Sahitya Darpan Hindi translation by (Shaligram
Shastri).

DHANANJAYA : Dash Rupakam (English Translation by Haas).

A. B. KEITH : Sanskrit Drama.

B. Principles of Modern Criticism :

The following syllabus is prescribed :

General Nature of Criticism ; criticism as literature ; its use and abuse ; imitation ; Functions of criticism ; kinds of Criticism—inductive and judicial. The problem of the valuation of literature, classic and romantic ; Modern Spirit of literature and canons of criticism ; History of Criticism in Hindi.

Nature and elements of literature : Personality in Literature ; Literature and Society ; Style ; Literary technique ; Classification of literature.

Nature and elements of Poetry ; classification of Poetry ; Poetic technique—Versification : Metres ; Pathetic fallacy ; Treatment of Nature in Poetry Poetic Truth ; Gadya Gita.

Elements of Fiction ; Character ; Truth and Morality in Fiction ; Atmosphere and Problems ;

Novel and Short Story ; Principles of the Composition of a Short Story ; Novel and Drama ; Criticism of Life.

Elements of drama ; Natural divisions of a dramatic Plot ; Different types of drama ; Main differences from the Sanskrit drama. Brief history of the dramatic art. One-Act plays : stage and the screen.

General features of the Essay ; Essay as a form of art ; various types of the Essay ; Travels ; Biography.

Books recommended—

SHYAM SUNDAR DAS : Sahityalochan.

VAKSHI : Vishwa Sahitya.

SCOTT JAMES : The Making of Literature.

W. P. KER : Epic and Romance.

CHANDLER : Aspects of Modern Drama.

HUDSON : Introduction to the Study of Literature.

NICOLL : Sanskrit Drama.

SHUKDEV BEHARI MISHRA	}	Sahitya
AND PARTAP NARAYAN MISHRA :		Parijat.
RAM DAHIN MISRA : Kavyaloka.		

Paper IV. History of Hindi Literature : Literary and Cultural History (with outlines of Political events) of Northern India ; Elements of Linguistic and Literary History of Urdu.

Books recommended :

RAM CHANDRA SHUKLA : Hindi Sahitya ka Itihas.

RAM KUMAR VARMA : Hindi Sahitya ka Alochnatmak Itihas, Part I.

HAZARI PRASAD DWIVEDI : Hindi Sahitya ki Bhumika.

AYODHYA SINGH UPADHYAYA : Hindi Bhasha aur Sahitya ka Vikas.

MISHRABANDHU : Vinoda, Vol. I (New Edition.),

MISHRABANDHU : Hindi Navaratna.

BENI PRASAD : Hindustan ki Purani Sabhyata.

FRAZER : Literary History of India.

FARQUHAR : Religious Literature of India.

HAVELL : History of Aryan Rule in India.

SMITH, V. A. : Oxford History of India.

OJHA : Madhyakalin Bharatiya Sanskriti.

BRAJ RATNADAS : Urdu Sahitya ka Itihas.

RAM BABU SAKSENA : History of Urdu Literature.

BAILEY : Urdu Literature.

Hindi—Final

There shall be four papers and a *viva voce* test.

Paper I—Medieval Poetry: Bhakti and Riti Kavya.

JANARDAN MISHRA : Vidyapati.

SURDAS : Bhramargit Sar.

Songs 1-35, 51-90, 167-180, 307-326, 360-382.

MIRABAI : Lyrics (Belvedere Press, Allahabad.)

TULSIDAS : Vinaya Patrika (leaving stotra.)

NANDADAS : Raspanchadhyayi, Bhavaragita
Rukmini Mangal and Rupa Manjari (Uma
Shankar Shukla : Nandadas).

KESHAVA : Ramchandrika (1-5 Prakash .

BIHARISUDHA : (edited by Mishrabandhu).

SENAPATI : Kavitta Ratnakar (First and Fourth Taranga).

DEVASUDHA : (edited by Mishrabandhu) upto 15 Shabdik Samanjasya.

Books recommended for reference :

RUP NARAIN PANDE : Shukoktisagar.

VIYOGI HARI : Braj Madhuri Sar.

JANARDAN MISRA : The Religious Poetry of Surdas.

D. P. PARIKH : Prachin Varta Rahasya, Part II.

Paper II.—Modern Literature.

(a) Essay :

BALKRISHNA BHATT : Sahitya Suman.

R. C. SHUKLA : Chintamani, Part I (Essays 1-10.)

(b) Novel and short story.

PREM CHAND : Godan.

BHAGAWATI CHARAN VARMA : Chitralkha.

Ikkis Kahaniyan.

The following stories are prescribed :

Devaratha ; Usne kaha tha ; Nasha ; Harik
jit ; Ganga Gangadatta aur Gangi ; Patni ;
Jhut Sach ; Do Banke ; Ghisa ; Rose ;

(d) DRAMA:

JAYASHANKAR PRASAD : Chandragupta.

RAM KUMAR VARMA : Charumitra.

Poetry :

MAITHILI SHARAN GUPTA : Saket, Cantos VIII and IX.

SUMITRA NANDAN PANT : Adhunik Kavi, No. 2. (Hindi Sahitya Sammelan .

RATNAKAR : Uddhava Shataka.

The following books are recommended :—

GOKULNATH : Ashtachhap.

VARSHNEYA : Adhunik Hindi Sahitya (1850-1900).

SHRI KRISHNA LAL : Adhunik Hindi Sahitya ka Vikas (1900—1925).

BRAJRATNA DAS : Bhartendu Harishchandra.

BRAJRATNA DAS : Hindi Natya Sahitya ka Itihas.

JAGANNATH PRASAD : Prasad ke Natakon ka Shastriya Adhyayana.

KESRAI NARAYAN SHUKLA : Adhunik Hindi
Kavyadhara.

SHIVA NARAYAN SRIVASTAVA : Hindi Upanyas

PADMA SINGH SHARMA : Hindi, Urdu aur
Hindustani.

Paper III.—Principles of the Science of
Language and Historical Grammar of Hindi.

The following syllabus is prescribed :—

A.—Principles of the Science of Language.

Scope, divison and history of the science ;
origin, nature and classification of language ;
linguistic change and its causes ; mechanism of
speech and classification of sounds ; sound changes—
conditional and unconditional ; morphological
development of language ; semantic change and its
causes ; Historical syntax ; change in vocabulary
history of writing.

B.—Historical Grammar of Hindi.

The Hindi sound system and outlines of its
evolution ; treatment of foreign sounds ; accent ;
formation of the nominal stem ; history of case ;
gender and number ; origin of postpositions ;
numerals ; pronouns ; structure of verbal stems ;

auxiliary verbs ; participles ; formation of tenses ; voice ; causative ; compound verbs ; indeclinables.

Note.—Candidates will be expected to study historical grammar of Hindi with special reference to standard Khari Boli, but the study of the special features of other important dialects, such as Braj and Awadhi, should not be neglected. A general comparative knowledge of the chief characteristics of the New Indo-Aryan languages is also desirable.

They are also to have a general acquaintance with the history of the development of the Indo-Aryan speech in the Old Indo-Aryan (Vedic, Brahmanic and Sanskrit) and middle Indo-Aryan (Pali, Prakrit and Apabhraṃsa) periods
Books recommended for reference :—

BABU RAM SAKSENA : Samanya Bhasha Vigyan

TARAPOREWALA : Elements of the Science of Language.

JESPERSON: Language, its Nature, Development, and Origin.

GRAFF : Language and Languages.

VENDRYES : Language.

DHIRENDRA VERRMA : Hindi Bhasha ka Itihas.

CHATTERJI : Hindi and Indo-Aryan, Part I.

CHATTERJI : Origin and Development of Bengali Language (Introduction).

GRIERSON : Linguistic Survey of India,
Volume I, Part I.

BABU RAM SAKSENA : The Evolution of
Awadhi.

DHIRENDRA VARMA : Brajbhasha Vyakaran.
Paper IV.—Essay.

Urdu—Previous.

There shall be four papers and a *viva voce* test.

Paper I—Masnavis—Religious and Secular :—

- (۱) میر حسن — ۱ سحرالبین
- (۲) دیا شکر نسیم — گلزار نسیم
- (۳) منہر شکوہ آبادی — انتخاب معراج المصطفیٰ
- (۴) میر — دریائے عشق
- (۵) محسن کاکوری - مثنوی صبیح تجلی

Paper II—Prose :—

- (۱) باغ و بہار
 - (۲) یادگار غالب
- (Omitting the chapter dealing with Ghalib's Persian works.)

- (۳) فسانہ عجائب -
- (۴) طلسم ہوشربا - جلد ہفتم
- (۵) آرائش محفل - حیدری
- (۶) اخوان الصفا - حصہ اول

Or
Early Literature.

- (۱) سب دس
- (۲) معراج العاشقین
- (۳) قطب مشقري
- (۴) غزلیات بحري

Paper II—Modern Poetry.

- (۱) اکبر - کلیات اکبر جلد اول
- (۲) اقبال - بارگ درا بال جبریل
- (۳) چکبست - صبح وطن
- (۴) جوش - شعله و شبنم - حرف و حکایات
- (۵) عزیز - گلکده عزیز

(By Tirlokchand Mahroom)

- (۶) انتخاب کلام حسرت
- (۷) فانی - باقیات فانی

Note.—Candidates are expected to possess a working knowledge of prosody.

Paper IV—

- (a) Literary and Linguistic History of Urdu
- (b) And Elementary knowledge of the Literary History of Hindi.
- (c) Cultural History (with outlines of Political events) of India.

The following books are recommended :—

1. Ab-e-Hayat. آب حیات
2. GRIERSON : Linguistic Survey of India, Vol. I, Part I, Introduction.
3. SAINTSBURY : History of Criticism.
4. HUDSON : Introduction to the study of Literature.
5. Sakhundan Faras, Part 2, Lecture 10.
ساختندان فارس - حصہ دوم (دسواں خطبہ)
6. SAKSENA. R. B.: History of Urdu Literature (Urdu Translation, published by Newal Kishore Press, Lucknow).
7. Gul-i-Rana. گل رعنا
8. KAYES : History of Hindi Literature.
9. Greave's Outline of Hindi Literature.
10. Imperial Gazetteer, Vol. 2 (relevant chapters.)
11. Dakhan men Urdu, Third Edition.
دکھن میں بار اردو (سوم)
12. Urdu Zaban-o-Adab اردو زبان و ادب
13. Punjab men Urdu پنجاب میں اردو
14. Urdu-i-Qadim اردوئے قدیم

15. Urdu-Shah Paray, Part I.

اُردو شہ پارے - حصہ اول

16. Mahboob-i-Zaman

..محبوب الزمان تذکرۂ شعراء دکن (ہر دو حصہ)

Urdu—Final

There shall be four papers and a *viva voce* test.

Paper I—Modern Prose:—

(۱) غالب - ادبی خطوط غالب مرتبہ مرزا محمد عسکری

(۲) چند تلقیدات عبدالحق

(۳) ڈاکٹر ہادی - امراؤ جان ادا

(۴) مولوی چراغ علی - تہذیب الاخلاق جلد سوم

(۵) رتن ناتھ سرشار - فسانہ آزاد جلد اول

(۶) پندت برجموہن دتا تریا کیفی - منشورات باسٹلانی

گل گلاب - نئی شاعری کا پہلا مشاعرہ - نظر اور
خود نظری تشبیہ

(۷) سید سلیمان ندوی - نقوش سلیمانی

(۸) انتخاب ذیل از مقالات شبلی جلد دوم و سوم

از جلد دوم - (۱) فن بلاغت (۲) سر سید موحوم

اور اردو لتیریچر (۳) املا اور صحت الفاظ (۴) اردو

ہندی (۵) بہاشا زبان اور مسلمان (۶) تحفۃ الہند

(صنائع و بدائع) از جلد سوم

(۱) مسلمانوں کی گذشتہ تعلیم

(۲) مدرسہ اور دارالعلوم

(۳) قدیم تعلیم

(۴) تعلیم قدیم و جدید

Paper II. — Marsiya

مراثی	{	سودا
		مہر

ضمیر - پانچ مرثیے از ابتدائے جلد اول

انیس - جلد اول مکمل مطبوعہ نظامی پریس بدایوں

دبیر - جلد اول مکمل مطبوعہ نولکشور پریس لکھنؤ

Books to be consulted:—

موازنہ انیس و دبیر - حیات دبیر

یادگار انیس - المہزان -

واقعات کربلا - مولفہ و مرتبہ مولوی سہد سامن علی

اردو شہ پارے Relevant portions of

A Short History of the Saracens, Chapter VII
by Syed Amir Ali.

Paper III.—Qasida and Ghazal.

(a) Qasida :—

(۱) سودا (a) اُتھ گھا بہمن و دے کا چمستان سے عمل

(b) کہے ہے کاتب دوران سے مدشی تقدیر

(c) سوائے خاک نہ کھینچونگا ملت دستار

(۲) ذوق (a) شب کو میں اپنے سر بستر خواب و راحت

(b) زہ نشاط اگر کیجئے اسے تحریر

(c) لاتا نیرنگ سے ہے رنگ نئے چرخ محیل

(۳) مومن (a) صبح ہوئی تو کیا ہوا ہے وہی تیرہ اختری

(b) چاہنا خلق کو صہبا و صدم سے محروم

- (۴) غالب (a) صبح دم دروازہ خاور کھلا
(b) دھر جز جلوۂ یکتائی معشوق نہی
- (۵) انشا (a) اے خداوند مہ و مہر و ثریا و شفق
(b) بگھیاں نور کی تیار کر اے بوئے سمن
- (۶) منہر (a) غرق ہوا چاہ مہوں یوسف گل پھرہن
(b) نو خوردشید جو ہو صاعقہ طرر حمل
- (۷) امیر (a) تخت کاغذ پہ ہوا صدر نشین شاہ قلم
(b) مژدہ اے اہل تماشا کہ ہے ہنگام نظر
- (۸) عزیز (a) ہے تا بہ عرش گلستاں کا گوشہ دستار
(b) نصاب مکتب پیر مغان ہے درس عرفانی

Not less than 100 couplets be selected from lengthy Qasidas.

(b) Ghazal:

- (۱) تاباں - دیوان تاباں
(۲) ولی ددیف ”ی“ (غزلیات)
(۳) یقین - دیوان غزلیات
(۴) دیوان غالب - ددیف ن ی
(۵) انتخاب میر مولفہ ڈاکٹر عبدالحق

Paper IV.—Essay in Urdu.

The following books are recommended for consultation:—

- I. Qawaid i-Urdu by Abdul Haq.
- II. Majma-ul-Fawa'id by Moulvi Syed Hamid Ali.

N.B.—M. A. students are expected to have a sound knowledge of Grammar, Rhetoric and Prosody. Questions on the above subjects may be put in papers I and II.

Mental and Moral Science

M.A.—Previous

There shall be four papers and a *viva voce* test.

First Paper: Indian Philosophy or Islamic Philosophy.

Books recommended—

INDIAN PHILOSOPHY

- (i) HIRIYANNA: Outlines of Indian Philosophy.
- (ii) RADHAKRISHNAN: History of Indian philosophy, 2 Vols.
- (iii) R. D. RANADE: A Constructive Survey of Upanishadic Philosophy.

ISLAMIC PHILOSOPHY

- (i) IQBAL: Development of Metaphysics in Persia.
- (ii) O'LEARY: Arabic Thought and its Place in History.

- (iii) BOER : History of Philosophy in Islam.
- (iv) NICHOLSON : Studies in Islamic Mysticism.
- (v) RENAN : Averoes et la Averroism (Eng. Tr.)
**Second Paper ; History of European
Philosophy** with special reference to
Plato, Aristotle, Spinoza and Kant.

Books recommended :—

- (i) ADAMSON : Development of Greek Philosophy.
- (ii) FAICKENBERG : History of Modern Philosophy.
- (iii) BURNET : Thales to Plato.
- (iv) RAND : Modern Classical Philosophers.

Third Paper : Advanced Psychology.

Books recommended :—

- (i) MURPHY : Historical Introduction to Modern Psychology.
- (ii) JAMES : Principles of Psychology.
- (iii) McDOUGALL : Outline of Psychology.
- (iv) P. S. NAIDU : Hormic Theory.

Books for reference :—

- (i) WATSON : Behaviourism.
- (ii) FREUD : Selections (Kitabistan).
- (iii) SPEARMAN : Psychology Down the Ages.
- (iv) HARTMANN : Gestalt Psychology.

Fourth Paper : Ethics.

Books recommended :—

- (i) ROGERS : History of Ethics (New and Revised Edition).
- (ii) PLATO : Republic.
- (iii) GREEN : Prolegomena to Ethics.
- (iv) N. HARTMANN : Ethics Vol. I.

M. A.—Final

There shall be four papers and a *viva voce* test.

Paper I—Contemporary Philosophy :

Books recommended :—

- (1) ALIOTTA : Idealistic Reaction Against Science.
- (2) COLLINGWOOD : Essays on Metaphysics.
- (3) A. C. MUKERJI : Self, Thought and Reality
- (4) S. K. MAITRA : Neo-romantic movement in Contemporary Philosophy.

Books to be consulted :—

- (1) BRADLEY : Appearance and Reality.
- (2) METZ : Hundred years of British Philosophy.
- (3) H. HALDAR : Neo-Hegelianism.
- (4) BERGSON : Two Sources of Morality and Religion.
- (5) WHITEHEAD : Process and Reality.

Papers II and III.—Any two of the following subjects :—

- (1) *The Philosophy of Plato*, to be studied from his principal Dialogues, as well as books on the Philosophy of Plato.

The following works are recommended :—

- (i) The Republic.
 - (ii) The Timaeus.
 - (iii) The Philebus.
 - (iv) The Parmenides.
 - (v) ZELLER : Plato and the Older Academy.
 - (vi) TAYLOR : Plato—the Man and his Work.
 - (vii) BURNET : Greek Philosophy from Thales to Plato.
- (2) *The Philosophy of Aristotle*, to be studied from his principal works, as well as books on the Philosophy of Aristotle.

The following works are recommended :—

- (i) Metaphysics (Vol. VIII) Oxford Trans.
- (ii) De Anima (R. D. Hicks, Cambridge).
- (iii) Physics (Oxford Trans.).
- (iv) Nicomachean Ethics (Oxford Trans.).
- (v) ZELLER : Aristotle (2 Vols.)
- (vi) ROSS : Aristotle.
- (3) From Kant to Hegel.

Books recommended :—

- (1) The Heritage of Kant, Edited by G. T. Whitney and D. F. Bowers.
- (2) Kant's Selections (Scribner's).
- (3) G. R. G. MURE : Hegel.
- (4) The Logic of Hegel (Wallace's Translation).
- (5) EDWARD CAIRD : Hegel.

Books to be consulted : —

- (1) EDWARD CAIRD : The Critical Philosophy of Kant (2 Vols.).
- (2) PATON : Kant's Metaphysics of Experience (2 Vols.).
- (3) CROCE : What is living and what is dead in the Philosophy of Hegel.

- (4) *The Philosophy of Bergson*, to be studied from his principal works, as well as books on the philosophy of Bergson.

Books to be read :

- (i) BERGSON : Creative Evolution.
- (ii) LINDSAY : The Philosophy of Bergson.

Books to be consulted : —

BERGSON : Time and Free will.

BERGSON : Mind Energy.

- (5) *Philosophy of Religion*.

Books recommended : —

EDWARD CAIRD : The Evolution of Religion,
Vols. I and II.

JAMES : Varieties of Religious Experience.

Autobindo Ghosh : The Life Divine, Volume I.

LEUBA : Psychological Study of Religion.

PRINGLE-PATTISON : The Idea of God.

- (6) *Idealistic Logic*.

The following works are recommended :

- (i) BOSANQUET : Logic or the Morphology of Knowledge, 2 Volumes.

(ii) JOACHIM : The Nature of Truth.

(7) *History and Principles of Education.*

Books recommended :—

- (i) SANDIFORD : Educational Psychology.
- (ii) Rusk : Doctrines of Great Educators.
- (iii) Rusk : Philosophical Basis of Education.
- (iv) Creighton Miller : The New Psychology and the Teacher.

Books to be consulted :—

- (i) NUNN : Education, Its Data and First Principles.
- (ii) DEWEY : The School and the Child.
- (iii) BARBARA LOW : The Unconscious in Action.
- (8) *Philosophy of Shankaracharya.*

Books recommended :—

- (i) Translation of Sāṅkarabhāṣya by Thibaut, Vols. I and II, with special reference to I. 1—4, II. 1, II. 2., III. 2, IV. 4.
- (ii) A. C. MUKERJI : The Nature of Self.
- (iii) Das Gupta : History of Indian Philosophy, Vol. II.

Note.— A general knowledge of the non-Avaitic Systems of Vedanta is required.

(9) *Social Philosophy*

Books recommended :—

- (i) MICHAEL OAKESHOTT—The Social and Political Doctrines of Contemporary Europe.
- (ii) ALFRED ZIMMERN—Modern Political Doctrines.
- (iii) BHAGAWAN DAS—The Science of Social Organisation. 2 Vols.

(10) *Applied Psychology.*

Books recommended for study :—

- (i) GRIFFITH : Introduction to Applied Psychology.
- (ii) Myers : Industrial Psychology.
- (iii) HOLLINGWARTH : Vocational Psychology and Character Analysis.

For reference only.

- (i) MORE AND HARTMANN : Readings in Industrial Psychology .
- (ii) PROFFERBERGER : Applied Psychology.

(iii) PFISTER : Applications of Psycho-analysis.

(iv) CLAUDE MULLINS : Crime and Psychology.

(v) MITCHELL : Psychology of Medicine.

(11) *Islamic Philosophy.*

(1) The Summa Philosophica of Al-Shahrastani
Translated by A. Guillaume.

(2) The Kitab al Luma Fil Tasawwuf of Abu
Nasr al Sarraj. Translated by R. A. Nicholson.

(3) NICHOLSON : The idea of Personality in
Sufism.

(12) Two special Systems of Indian Philosophy
(1) the Nyaya-Vaisesika, and (2) the Vedanta, as in
Sanskrit M.A. Final Examination, Group D,
Philosophy, Papers I and III.

N.B.—Under new regulations, either or both of these
systems may be offered by Philosophy students, provided
that if they offer the Vedanta System, they will not be
allowed to take the 8th optional above, *Viz.*, the Philo-
sophy of Shankaracharya.

(13) *Social Psychology.*

Books recommended :—

KIMBALL YOUNG : Social Psychology.

McDOUGALL : Introduction to Social Psychology.

ALLPORT : Social Psychology.

For Reference :

MC DOUGALL : Group Mind.

FREUD : Group Psychology.

THOULESS : Psychology General and Social.

BERNARD : Introduction to Social Psychology.

GINSBERG : Psychology and Politics.

DUNLAP : Civilised Life.

(14) *Abnormal Psychology*.

Books recommended :—

DORCUS AND SHAFFER : Text Book of Abnormal Psychology.

FREUD : Introductory Lectures on Psychoanalysis.

For Reference :

McDOUGALL : Outline of Abnormal Psychology.

BRIDGES : Outline of Abnormal Psychology.

HOLLINGWORTH : Abnormal Psychology.

LOUTITT : Clinical Psychology.

ALLEN : Recent discoveries in Medical Psychology.

JUNG : Contribution to Analytic Psychology.

BOSE : Concept of Repression.

PRINCE : Unconscious.

JONES : Papers on Psycho-analysis.

Paper IV—Essay.

M. Ed. (Education).

Group A

Paper I Philosophy of Education.

Books Recommended : —

ADAMS : Evolution of Educational Theory.

DEWEY : Democracy and Education.

RUSK : Philosophical Bases of Education.

MONROE : Text Book in History of Education.

Books for Reference.

NUNN : Education, Its Data and First Principles.

BOYD : History of Western Education.

BODE : Modern Educational Theories.

HARDIE : Idealism in Education.

The Educational Classics of Plato, Locke, Spencer, Rousseau, Restalozzi; Herbart, Froebel, Montessori, and Tagore.

Paper II.

Advanced Educational Psychology and Experimental Education.

Books recommended :—

SANDIFORD : Educational Psychology.

VERNON : Measurement of Abilities.

TERMAN AND MERRILL : Measuring Intelligence.

Books for reference :—

WOODWORTH : Contemporary Schools of Psychology.

FLUGEL : Hundred years of Psychology.

FOX : Educational Psychology.

THORNDIKE : Educational Psychology.

HARTMAN : Educational Psychology.

LOW : The Unconscious in Action.

SORENSEN : Psychology in Education.

BALLARD : The New Examiner.

BALLARD : Mental Tests.

BALLARD : Group Tests.

MCCALL : Measurement.

GARRETT : Statistics.

HAWKES : Achievement Examination.

Psychological Tests of Educable Capacity (Board of Education)—

HAMLEY : Testing of Intelligence.

CATTELL : Guide to Mental Testing.

BURT : Mental and Scholastic Tests.

RUSK : Experimental Education.

KELLY : Interpretation of Educational Measurement.

Paper III—Comparative Education.

Comprising a comparative study of Educational Systems in India and in (1) One Eastern Country and (2) One Western Country (as may be decided on at the commencement of the Session.)

Books Recommended :

NURULLAH AND NAIK : History of Education in India.

DAS : Education of Ancient Hindus.

JAFFAR : Education in Muslim India.

BOYD : History of Western Education.

KANDEL : Comparative Education.

BIRCHENOUGH : History of Elementary Education in England and Wales.

SANDIFORD : Educational Systems.

ROMAN : New Education in Europe.

PINKEVITCH : New Education in Soviet Russia.

BEATICE KING : Changing Man the Recent Reports.

Year books of Education published in India, England and America.

Paper IV—Psychology of Childhood and Adolescence.

Books Recommended :

BROOKS : Child Psychology.

BROOKS : Psychology of Adolescence.

Books for Reference :

SKINNER AND HARRIMANN : Child Psychology.

CARMICHAEL : Child Psychology.

SUSAN ISSACS : Social Development in young children.

MONTESORI : Secret of Childhood.

KOFFKA : Growth of the Mind.

WATSON : Psychological Care of the Infant.

KLEIN : Psycho-Analysis of Children.

MURCHISON : Hand book of Child Psychology.

WHEELER : Youth.

BLOS : Adolescent Personality.

HOLLINGWORTH : Subnormal Children.

BURT : Young Delinquent.

BINET : Intelligence of the Feeble minded.

PAPER V—(For 1949).

Paper V—Vocational Guidance and Selection.

Books Recommended :

KELLER AND VITELLES : Vocational Guidance throughout the World.

MYERS : Principles and Technique of vocational guidance.

BINGHAM : Aptitudes and Aptitude Testing.

Books for Reference :

HOLLINGWORTH : Vocational Psychology.

KITSON : Psychology of Vocational Adjustment.

GRIFFITH : Fundamental of Vocational Psychology.

COLLINS AND DREVER : Psychology and Practical Life.

HULL : Aptitude Testing.

ECONOMICS

M. A. Previous and Final

For the M. A. Previous Examination there shall be five papers. Papers II and III are compulsory and three other papers are to be selected from papers IV to XVII. Each student shall also appear in a *viva voce* Examination.

Each student for the Previous Examination shall present an Essay written by him in Hindi, Urdu or English (in special cases) by the end of January to be approved by the Head of the Economics Department before he can be sent up for the examination and shall also appear in a *viva voce* examination in the medium in which he has offered Paper III. 50 marks will be allotted for the Essay Paper and 50 for the *viva voce*.

For the M. A. (Final) Examination the candidates shall take Paper I and any three of the remaining papers stated below. They shall also appear in a *viva voce* examination. Each student shall submit to his Seminar teacher one or more essays in the course of the year, one of which (to be selected by the Head of the Department in consultation with the Seminar teacher concerned) will be submitted to the *Viva Voce* Board which will examine

the candidate on the essay and the papers; the essay to become the property of the University.

The selection of optional papers is limited as follows :—

Candidates who have passed the B. A. examination must offer three of the following papers : IV, V, VI, VII or IX, provided. —

- (1) that students who passed the B.A. examination with Mathematics may offer only two of the above papers, if they offer either paper X or paper XI;
- (2) that students who pass the B. A. examination with History or Politics may offer only two of the above papers in case they offer either paper VIII, paper XII or paper XIII.

Candidates who have passed the B. Com. examination must offer at least three of the following papers: IV, V, VI, VII, VIII, IX, or XV, but they may not offer paper XIV.

The optional papers may be offered either for M. A. (Previous) Examination or for the M. A. (Final) Examination in those years in which these papers are taught, except papers XIX and XX which

may be offered only for the M. A. (Final) Examination.

Every year only those optional papers will be offered for study which are permitted by the Head of the Department of Economics.

Paper I.—Advanced Economic Theory—

(This course should be a revision of economic theory from the dynamic and integral points of view as in Wicksteed, Pigou, Fisher and Clark). The ultimate effects of inventions and improvements, specially cheaper transportation and communication. Relative growth of population. Dynamic relations of the relative value of investments in land, capital and labour power. Monopolies and price discrimination. Theoretical possibilities of economic progress.

The Paper comprises an advanced study of the following topics.

Pure Theory

1. General Economics.
 - A. Scope and Method.
 - (1) Definition.
 - (2) Nature & Significance.
 - (3) Methodology.

- (a) Postulates.
 - (b) Partial & General Equilibrium.
 - (c) Static & Dynamic Equilibrium.
- The Cob-Web Theorem.

B. Theory of Value.

(1) Determination of Commodity Prices.

- (a) Recent developments in the Theory of Consumers' Choice.
- (b) Monopoly. Types. Simple and Discriminating. Study of Public Utility—Rate Making. Comparison with Competition.
- (c) Duopoly and Bilateral Monopoly.
- (d) Imperfect Competition—Oligopoly.
- (e) Perfect Competition.
- (f) Scale of Production with reference to some of the above items. Increasing and Diminishing Returns. Optimum Scale.

(2) Determination of Factor Prices. Distribution.

- (a) Classical, Austrian, and Modern Marginal Productivity Theories.

(b) The nature of rent and profits. A higher study of their economic significance.

(c) Theory of Wages and Interest.

C. Fluctuation—Trade Cycles.

(a) Meaning and nature.

(b) Causes. A detailed study of the various Theories.

(c) A detailed study of the possible Remedies.

II. Economics of Social Welfare. A detailed study of the contributions of Professor Pigou and others.

Applied Economics

A Theoretical treatment of the following :—

A. The Population Problem. Supply of Labour.

B. Financial Topics. Supply of Capital.

C. Activities of the State.

D. Rationalisation.

E. Capitalism and Socialism.

F. Other Problems of Topical Interest.

Books recommended :—

1. MARSHALL : Principles of Economics.
2. PIGOU : Economics of Welfare (Latest Edition).
3. FISHER : Theory of Interest.
4. HICKS : Value and Capital.
5. WICKSELL : Lectures on Political Economy
6. ROBBINS : Essay on the Nature and Significance of Economic Science.
7. KNIGHT : Risk, Uncertainty and Profit.
8. MEADE : Economic Analysis and Policy.
9. HEBERLER : Prosperity and Depression.
10. MEHTA, J. K. : Elements of Economics.

Paper II.—History of Economic Thought including Social and Commercial Theories up to and inclusive of Marshall—A brief chronological account of the principal writers and schools followed by a connected history of the most important theories. The History of Socialistic parties is not included.

Books recommended :—

1. H. W. LADLER : A History of Socialistic Thought.

2. JOHN MACMARREY : The Philosophy of Communism.
3. SYDNEY AND BEATRICE WEBB : Soviet Communism.
4. LUDVIG VON MISES : Socialism.
5. HANEY : History of Economic Thought.
6. GIDE AND RIST : History of Economic Doctrines.
7. SCOTT : Economic Development.
8. SURANYI UNGER : Economics in the 20th Century.
9. KAUTILYA : Arthashastra.
10. BEVERIDGE, SIR W : Tariffs Re-examined.
11. ERIC ROLL : History of Economic Thought.
12. ALEXANDER GRAY : The Socialist Tradition.

Paper III.—Essay in Hindi or Urdu ..	50 marks
<i>viva voce</i>	50 marks

In very exceptional cases candidates may be permitted to take this essay in English with the permission of the Head of the Department.

Note.—The purpose of the Hindi and Urdu essays in Economics is (1) to enable the students to explain economic principles to illiterate people and (2) to enable them to think clearly and express clearly ideas which cannot be quite so clear to them in a foreign language as in their own tongue. Therefore the students are not expected to use highly technical terms which only scholars can understand. They are expected, as far as possible, to use the simple language of ordinary life. They are encouraged to use either Urdu or Hindi words, whichever they think will be more easily understood by the mass of the people, and may even use English words which have definitely become a part of the vernacular language such as Bank, Note, Dividend, Stock, Budget, Cheque, Machine, Pass-Book, Pension.

The Examiner should mark the essay chiefly on clarity of thought and expression and not on details of language.

Paper IV—Industrial Organisation and Problems of Indian Industry.

Forms & Types of Industrial Organisation.

Technique & Scale of Production.

Relation of Scientific Research to Industrial-Efficiency.

Scientific Management.

Internal Management of Factory.

Systems of Wage Payment in relation to Industrial Peace.

Recruitment and Housing of Labour.

Schemes of Rationalization.

Sales and Purchase Organisations.

Theory of Location & its application to Indian Industry.

Current Problems of major Indian heavy, key, and consumer goods Industries.

Small scale & cottage Industries & their productive Efficiency vis-a-vis large scale Industries.

Problems of cut-throat competition in Indian and Foreign market.

Indian Patents & designs.

Government Legislation & Policy and its Effects on Industrial Development.

Indian Managing Agency System.

Books Recommended :—

1. E. A. G. ROBINSON ..The Structure of Competitive Industry.
2. D. H. MACGREGOR ..Industrial Combination.
3. P. FITZGERALD ..Industrial Combination in England.

4. P. SARGANT FLORENCE. The Logic of Industrial Organisation.
5. HERMANN LEVY .. Monopolies, Cartels and Trusts in British Industry.
6. HERMANN LEVY .. The New Industrial System.
7. P. S. LOKANATHAN .. Industrial Organisation in India.
8. R. C. CHOWDHURY .. Industrial Organisation.
9. P. C. JAIN .. Industrial Problems of India.
10. HANEY .. Business Organisation & Combination.
11. HENRY SMITH .. Retail Distribution.
12. Indian Industrial Commission Report.
13. Reports of the Balfour Committee on British Industry and Trade.
14. Reports of the Tariff Boards on various Indian Industries.

15. TAYLOR

..Principles of Scientific Management.

Paper V—Financial Organisation—(This course should be a theoretical and descriptive study of the delicate adjustments by which Value and Ownership are determined). Real Economics and Money Economics. The nature of Monetary Economy. The definition of money. Functions, advantages and disadvantages of money Classification of money. The quantitative importance of various types of bank money and cash. The concepts of Velocity and Efficiency of circulation of money.

The theories of Value of Money. Fisher's formula, and the Cambridge formulæ. The plurality of price levels The general price level. The diffusion of Price levels. Comparisons of purchasing power. The fundamental equations of Keynes. Savings and investments. The *modus operandi* of the Bank Rate. Inflation, Deflation, Reflation. Price fluctuations and their consequences. Inflation as a method of taxation. Trade cycles, various theories. Gold standard, in its various forms. Recent monetary development. Monetary Reform. The world depression of 1929-33. Subsequent recovery.

The Indian currency system. The ratio controversy. Gold exports from India. The mechanism

of the Council Bill and Reverse Council Bill system. Sterling purchases and sales. Foreign Exchange in India.

Deposit banking. Cheques, Bills of Exchange and other negotiable instruments. The organisation of the money-market. Discount houses, Accepting houses, bill brokers. Central Banking. Control of member banks. Regulation of Note Issue. Methods of credit control. Relations between Central Banks. International banking. The Bank of International Settlements. Foreign banking system. Indian banking ; indigenous, joint stock and exchange.

Foreign exchanges. Mechanism of the Gold points. The Purchasing Power Parity theory and the Balance of Payments theory of foreign exchange. The Balance of International Payments.

Stock and Shares Investment and Speculation. Stock Exchanges and their organisation. Bulls and Bears. Fluctuations in prices of securities. Indian Stock Exchanges. Proposals for Reform.

Books recommended : —

1. MARSHALL : Money, Credit and Commerce.
2. The Future of Monetary Policy, published by the Institute of International Affairs.

3. CASSEL : Memorandum on the World's Monetary Problems (League of Nations).
4. Report of the Central Banking Enquiry Committee, Volume I. Parts I and II, 1931.
5. JAIN L. C. : Monetary Problems of India.
6. KEYNES : Treatise on Money, Vols. 1 and 2.
7. HAYEK : Prices and Production.
8. HAYEK : Monetary Theory and the Trade Cycle.
9. ADARKAR : Theory of Monetary Policy.
10. CASSEL : Downfall of the Gold Standard.
11. CROWTHER : An Outline of Money.
12. SAYERS : Modern Banking.
13. SANLINET : Contemporary Monetary Theories.
14. COLE : Money, its Present and Future.
15. MALHOTRA, D. K. : History of Indian Currency and Exchange, (latest edition).
16. HAYEK : Monetary Theory and Trade Cycle.

17. BRIJ NARAIN : Money and Banking.
18. GHOSH, B. C. : A Study of Indian Money Market.
19. GARG, K. L. : Stock Exchanges in India.
20. ROBINSON, JOAN : Introduction to the Theory of Employment.
22. HABERLER : Prosperity and Depression.
23. HARROD : The Trade Cycle.
24. Royal Institute of International Affairs : The Future of Monetary Policy.

Paper VI.—Rural Economics—Land Tenures, Agricultural Improvements. Irrigation and Communications. The importance and possibilities of village industries. District Board Finance. Contrast between Rural and Municipal Problems.

Books recommended :—

1. DARLING : The Punjab Peasant in Prosperity and Debt.
2. MUKERJEE, R. K. : Food Planning for Four Hundred Millions.
3. HOWARD : Crop Production in India.
4. CARVER : Principles of Rural Economics.
5. LEAKE : Foundations of Agriculture in India.

6. Report of the Royal Commission on Agriculture in India.
7. Report of the U. P. Banking Enquiry Committee (Selected Chapters).
8. M. B. NANAVATI AND J. J. ANJARIA : The Indian Rural Problem.
9. TARIK SINGH : Poverty and Social Change.
10. Final Report of the Famine Enquiry Commission, Bengal.
11. Report of the U. P. Agriculture Reorganisation Committee, 1941.

Paper VII.—Labour and Urban Problems—

British Labour Movement.—History up to the present time. Trade Unions : structure, functions and government. Industrial peace, conciliation and arbitration. Education and Research Department International connections.

Indian Labour.—Village background, connection and influence. Recruitment, conditions, security promotion. Hours. Wages. Minimum wage. Child Labour. Labour of Women. Trade Unions, characteristics, history, future. Industrial peace, works committee, machinery for conciliation and arbitration. Health, die, maternity benefits, industrial diseases. Town-planning, housing, village-

settlements. Building regulations and sanitation. Education, general and technical. Agencies. Welfare work, recreation civic amenities agencies, Debts, co-operative credit and distributive stores.

Life of labouring classes in typical Indian industries : cotton, jute, coal, metallurgical, mining, shipping, railways, Plantations. seasonal industries.

Labour and the Constitution, central, provincial and municipal.

Labour research and statistical bureaus.

International Labour Organisation. Pre-war history. Constitution, organisation, and functions Achievements. Prospects.

Books recommended :—

1. BLOOM, S. : Labour Economics.
2. RECHITON, J. H. : The Minimum Wage.
3. HICKS, J. R. : Theory of Wages.
4. SHIVARAO, B. : The Industrial Worker in India.
5. COLE, G. D. H. : History of the British working Class Movement, Vols. I, II and III.
6. CUNINSON, J. : Labour Organisation.
7. LANCASTER, H. V. : The Art of Town Planning.

8. KELLY, E. T. : Welfare Work in Industry.
9. Report of the Royal Commission on Indian Labour, 1931.
10. Reports of I. L. O. and Labour Commission
Reports to be indicated during the course of the session.
11. RADHA KAMAL MUKERJI : The Indian Working Class.
12. MAURICE DOBB : Wages.
13. KUCKZINSKY : A Short History of the Labour Conditions in Great Britain.
14. KUCKZINSKY : A Short History of the Labour Conditions in the British Empire.

Paper VIII.—State and Economic Activities.

1. Brief survey of the evolution of the concept of the State and its functions in the economic sphere.

2. Historical review of State policy in India from the beginning of the 19th century to present day, with special reference to the following :

- (a) Utilization and development of the natural resources, such as forests, fisheries—soil erosion (prevention), water power (hydel, irrigation and navigation), mineral assets.

- (b) Development and care of human resources—a study of population dynamics and its effects on wealth and welfare. Age and sex distribution. Birth and death rates. Mortality of infants and mothers of child bearing age. General education, technical and vocational training. Public health, sanitation and community hygiene. Prevention of adulteration of food, drinks and drugs. Employment and unemployment, with particular reference to unemployment, old age, health insurance and maternity benefits.
- (c) Problems of supplies: Procurement grading, storage and marketing. Price control, price stabilization and rationing. Famine insurance.
- (d) Excise policy and control of narcotics.
- (e) Crime and punishment—juvenile delinquency. Reclamation of criminal tribes. Problem of white slave traffic.

3. Economic Planning. Public works policy. Control and management of monopolies, public utilities, essential services and corporations. Organisation of research. Maximization of social welfare—the main objective of Economic Planning.

4. United Nations Organisation, with special reference to Economic and Social Council.

Books recommended :—

1. HAROLD J LASKI : A Grammar of Politics (Specified chapters).
2. G. D. H. COLE : The Intelligent Man's Guide To the Post-War World.
3. A. C. PIGOU : The Economics of Welfare (Specified chapters).
4. H. A. SILVERMAN : Economics of Social Problems.
5. HERMAN FINER : The Theory And Practice of Modern Government. Vols. I & II (Specified chapters).
6. F. E. LAWLEY : The Growth of Collective Economy. Vols. I & II (Specified chapters).
7. J. M. KEYNES : The End of Laissez Faire.
8. H. D. DICKINSON : Economics of Socialism.
9. Encyclopaedia of The Social Sciences. (Selected topics).
10. WADIA AND MERCHANT : Our Economic Problem.
11. JATHAR AND BERI : Indian Economics.
12. The Indian Year Book (Latest Edition).

Paper IX.—Public Finance.

General. The scope of the Science. Definition. Relation to economics and politics. Difference between public and private finance. Public Expenditure :—

General. Importance of public expenditure. Its classification : canons or principles. Relation of public expenditure to economic productivity and tax-paying capacity.

Descriptive. A detailed and critical study of expenditure on principal heads such as defence-law and order, education, agriculture, industries, sanitation, roads, railways, and other means of communication, and public undertakings (with special reference to India).

Distribution, of functions between Central, Provincial, and Local Governments, General principles and Historical study.

Expenditure of District Boards and Municipalities.

Public Revenue :—

General. Importance of public revenue. Its classification. Taxes, fees, prices. Direct and indirect taxes. Canons or principles. Ability or faculty theory. Equal, proportional, and least aggregate sacrifice theories. Progressive, regressive and degressive taxes. The single tax. Double taxation.

Shifting and incidence of taxation. Various theories. General principles. Special study with regard to incidence of excise duties, taxes on imports, land and house rents, profits, monopoly output and revenue, income and inheritance.

Distribution of resources between Central, Provincial and Local Government. Principles. Federal finance in India.

Descriptive. A detailed and critical study of the principal heads of revenue such as income and inheritance taxes, land revenue, customs duties, excise duties, stamp duties and irrigation, the salt tax, revenue from Government undertakings.

District Boards and Municipal Revenue.

Public Debt :—

General. Its importance. Public and private debts compared. Difference between finance by loans and finance by taxes. Redeemable and irredeemable loans. Forms of public debts. Methods of redemption.

Descriptive. Public Debt of India. Rupee and Sterling debts. Productive and unproductive debts. Central, Provincial, and Local debts. Funded and unfunded debts. Provision for the redemption of debts.

Financial Administration :—

Its importance. The budget. Its essential features. The framing of estimates. Estimates in the legislature. Demands for grants and the Finance Bill. Votable and non-votable expenditures in Central and Provincial Governments. Separation of railway budget from the general budget.

The Municipal and District Board budgets.

Books prescribed :—

1. SHIRRAS, G. F. : The Science of Public Finance.

2. DALTON : Public Finance.

3. COMSTOCK, A. : Taxation in the Modern State.

4. SHAH, K. T. : Constitution, Functions, and Finance of Indian Municipalities.

5. Report of the Taxation Enquiry Committee.

6. Report of the Statutory Commission.

7. GYAN CHAND : Essentials of Federal Finance.

8. ADARKAR : Principles and Problems of Federal Finance.

9. Otto Niemeyer's Report on Financial Relations.
10. J. K. MEHTA : The Nature, Classification and Principles of Public Revenue and Expenditure.

Books recommended :—

1. PIGOU : A Study in Public Finance.
2. SELIGMAN : Essays in Taxation.
3. GYAN CHAND : Financial Administration in British India.
4. SHAH, K. T. : Federal Finance.
5. Report of Federal Finance Committee of the Round Table Conference (Percy).
6. Proposals for the Indian Constitution.
7. Report of the Working of the District Boards and Municipalities in the United Provinces.
8. Report of the States Enquiry Committee (Financial) Davidson Committee.

Paper X.—Theory and Practice of Statistics—Relation of statistics to other sciences. Enumeration, compilation, and tabulation of data.

The theory of statistics, not requiring a knowledge of the calculus. Elements of the theory of pro-

bability. Frequency distributions and the graphical representation of groups. Averages and measures of dispersion and of skewness. Graphic methods including logarithmic curves and elementary curve-fitting, e. g., curves representing the law of diminishing returns, based on statistics. Index numbers. Correlation for two variables, Association and contingency. Graphic and algebraic methods of interpolation and extrapolation. Accuracy and sampling as affecting the above statistical measures. The significance of observed difference between averages. Elementary methods of dealing with population and vital statistics.

Practical methods used in the analysis and interpretation of statistics of prices, wages, incomes, trade, transport, production and consumption. Common errors in the interpretation and representation of statistics. Methods used in handling business statistics. The investigation of periodicity by graphical and arithmetical methods. General trend. Forecasting of fluctuations of economic phenomena. Methods of measuring and forecasting population growth.

A knowledge of the use of slide rules and calculating machines will be required.

Books recommended :—

1. BOWLEY : Elements of Statistics.
2. BOWLEY : Elementary Manual of Statistics (Second Edit.)
3. YULE AND KENDEL : An Introduction to the Theory of Statistics.
4. BODDINGTON : Statistics And their Application to Commerce.
5. CONNOR : Statistics.
6. Report of the Indian Economic Enquiry Committee.
7. DUBEY AND AGARWALA : Elementary Statistics.
8. Bowley-Robertson Committee Report.
9. Statistical Abstract for British India (latest edition).
10. Census of India, 1941, Vol. 1, Part I.
11. Census of India, 1931, Vol. 1, Part I.
12. Theory and Practice of Statistics by M. K. Ghosh and S. C. Chaudhary.

Note.—The Examination in Statistics shall be divided into two parts (1) Theoretical and (2) Practical. The time allowed for the first part, Theoretical, shall be $1\frac{1}{2}$ hours, and for the second part, Practical, three hours.

Forty marks shall be allotted to the first part and 60 marked to the second. Both examinations shall be set and marked by one examiner, but the two parts shall be printed and given to the students separately at different times. It will not be necessary to pass in each part separately.

Paper XI.—*Mathematical Economics*.—Marginal utility. Indifference curves. The contract curve. Demand and supply curve. Elasticity of demand and supply. Consumer's and producer's surplus. Equations of the equilibrium of exchange under simple and complex condition of competition and of monopoly. Problems of Taxations. Supply and demand of the factors of production. Application of the equations of equilibrium to the problem of distribution. Application of mathematical method to problems of foreign trade, transportation and rent. Distinction between static and dynamic economics. Short-periods curves and Planning curves. Relations between pure mathematical economics and statistics. Possibility of obtaining equations representing actual conditions.

1. MARSHALL : Principles of Economics.
2. BOWLEY : The Mathematical Groundwork of Economics, Oxford, 1924.
3. FISHER : Nature of Capital and Income.
4. FISHER : The Theory of Interest.

5. ALLEN, R. G. D. : Mathematical Analysis for Economists.
6. ROBINSON, JOAN : Economics of Imperfect Competition.
7. EVANS, G. C. : Introduction to Mathematical Economics.
8. Econometrica (selected articles).

Paper XII.—*Economic Development of England and India*, with special reference to the period after 1760.

The Manor. The Guild. The Domestic System. The Agricultural Revolution. The Industrial Revolution. The Factory System. Changes in Transportation and Marketing and their effects. Similar material for India as far as possible. The history of the industrial and commercial organisation of two or more important industries both in England and India to be studied in detail, such as wheat or sugar, cotton or wool, iron or building trade, paper or glass. The history of inventions and of the status of labour to be treated briefly.

Books recommended :—

1. GADGIL : The Industrial Evolution of India (2nd edition).

2. KNOWLES : Economic Development of the British Overseas Empire, Vol. I (Tropical : Part dealing with India.)
3. KNOWLES : The Industrial and Commercial Revolutions in Great Britain during the 19th Century.
4. BRIGGS : Economic History of England.
5. SHAH, N. J. : History of Indian Tariffs.
6. HAMMOND : The Rise of Modern Industry.
7. ANSTEY, VERA : Economic Development of India.
8. DR. L. C. JAIN : Indian Economy during the War.
9. ARTHUR BIRNIES : Economic History of the British Isles.
10. MEREDITH : Economic History of England.
11. BUCHANAN : Development of Capitalistic Enterprise in India.
12. VENKATSUBBIAH : The Structural Basis of Indian Economy.
13. TYSON : India Arms for Victory.

Paper XIII.—*Economic and Commercial Geography*—The Economic and Commercial Geography of Eurasia and East Africa, the monsoon lands

(India, China, Japan, etc.) and the chief commercial countries of Europe will be studied in detail, other parts in outline, more particular attention being given to cases which illustrate general truths or provide illustrations of the growth of industrial or commercial centres. Trade routes, particularly those of the Atlantic and Indian Oceans. (The course will include practical work such as the study and construction of statistical maps and charts and sketch maps.)

Books recommended :—

1. MAC FARLANE : Economic Geography.
2. BROWN, R. N. B. : Principles of Economic Geography.
3. CHISHOLM : Handbook of Commercial Geography.
4. TROTTER, S. : Geography of Commerce.
5. RUSSELL SMITH : Industrial and Commercial Geography.
6. JONES AND WHITTLESEY : Introduction to Economic Geography, 2 Volumes.
7. DUBEY, R. N. : Economic and Commercial Geography.
8. STAMP : Asia.

9. SMITH, D. H. : Economic Geography of Europe.
10. MUKERJI : Economic Geography of India.
11. LYDE : Continent of Europe.
12. LEATS : Natural History of Raw Materials of Commerce.
13. GEORGE WATT : The Commercial Products of India.
14. HERBERTSON, A. J. AND HOWARTH, O. : The Oxford Survey of the British Empire, 6 Volumes.

Paper XIV.—*Transport.*

- (1) *Railway Transport*—Capital and Expenditure Combinations. Rates and Fares. Classification of goods and minerals. Discrimination and undue preference. State Regulation of rates and fares. State ownership and management.
- (2) *Indian Railways*—Development. Relation to the State. Management. Financing. Relation to one another. Internal Administration an executive organisation. Changes suggested by the Acworth Commission.
- (3) *Road Transport*—Economics of road construction and maintenance. Theories of

rates and fares. Types of road transport. Relation to the State. Relation of road to railway transport. Roads and road transport as means of opening up undeveloped and outlying tracts.

- (4) *Sea Transport*—Outline of its development. Modern shipping and World Commerce with special reference to Indian trade. Ocean routes. Organisation of Ocean Transport Service. Economics of Marine. Fuel Rates and Fares. Monopoly and Competition. Rate and Traffic Agreements. Pools and Conferences. Shipping Rings. The Deferred Rebate System and the Rate War. Government aid and regulations of Ocean Transportation. Ports, their functions and dues. Influence of the Great War On shipping. Indian Mercantile Marine. The Indian Navy. Marine Insurance.

- (5) *Air Transport*—Modern Developments. Commercial possibilities of Air Transport. Air Routes. International Air Navigation. Commercial Organisation of Air Services. State versus Private operation. Basic principles of and Economic Factors in the operation of services. Ground

Organisation. Traffic Control. Passenger, Freight and Mails. Effect of other forms of transport. Present Development of air transport in India.

Books recommended :—

Transport.

1. K. G. FENELON : Railway Economics.
2. GHOSE, S. C. : Indian Railway Economics, Parts I and III.
3. GHOSE, S. C. : A Paper on Railway Economics.
4. SHORRINGTON : Railway Transport in Great Britain.
5. FENELON, K. G. : The Economics of Road Transport.
6. RIPLEY : Railroad Problems (Selected chapters).
7. RIPLEY : Railroad-Finance and Organisation.
8. WELD : India's Demand for Transportation.
9. MEHTA : Indian Railway Rates and Regulations.
10. SANYAL : Indian Railways.

11. SRINIVASAN : The Law and Theory of Railway Freight Rates.
12. STEPHENSON : Communications.
13. M. K. GHOSH : Transport Development and Co-ordination.
14. EDWARD AND TYMMS : Commercial Air Transport.
15. JOHSON AND HUCHNER : Principles of Ocean Transportation.
16. Report of the Road Development Committee in India.
17. Indian Mercantile Committee Report.
18. Mitchell-Kirknees Report.
19. Wedgewood Committee Report.

Paper XV.—*International Trade and Fiscal Policy*
—Mercantilism and earlier theories of International Trade. The Theory of Comparative Costs. Distinguishing features of International Trade. International Trade as a special case of general exchange. The gain from foreign trade. International Division of Labour. Recent theories. Balance of payments ; Balance of indebtedness and balance of trade. Foreign Exchanges—Theory and relation with International Trade. Real Ratio of International Trade. Spot and forward Exchanges.

Fiscal policy. Free trade. Protection. Bilateral Agreements and the "most-favoured-nation clause." The technique of tariff-making. Fiscal administration and machinery.

India's foreign trade and balance of payments. India's fiscal policy : Discriminating Protection Imperial preference.

Present Condition of International Trade and Exchanges.

Books recommended :—

1. MARSHALL : Money, Credit and Commerce.
2. EDGEWORTH : Papers relating to political Economy, Vol. II Section IV.
3. OHLIN : International and Interregional Trade.
4. HEBERLER : The Theory of International Trade.
5. JACOB VINER : International Trade Theories.
6. R. F. HARROD : International Economics.
7. BEVERIDGE and others : Tariffs, the case examined.
8. B. P. ADARKAR : Indian Fiscal Policy.

9. Review of the Trade of India (Several Years).

10. World Economic Survey (Several Years).

Paper XVI.—*Co-operation*—Co-operation as a principle. Its application to modern business life. Its genesis and development in Europe and the Far East. Its working in America. This part is to cover all the European countries about which literature is available such as Germany, Italy, Russia, France, Denmark and England. Also Japan, China and America.

Co-operation in India. Its evolution and history. Co-operative Law in the various Provinces. Various forms of co-operative activity—their constitution and working principles.

Various forms of co-operative activity. Degree of success achieved in the various Provinces.

Organisation for propaganda and control. Co-operative Finance and Accounting. Co-ordinating and higher agencies in the Co-operative Movement. Criticism of the existing things, and lines of further developments.

Books recommended :—

1. WOLFF—Peoples Banks.
2. FAY, C. R.—Co-operation at Home and Abroad.

3. HOUGH, E. M.—The Co-operative Movement in India.
4. KAJI, H. L.—Co-operation in India.
5. TUCKER, D. S.—Evolution of Peoples Banks in China.
6. JEVONS, H. S.—Economic Inequality in Co-operative Commonwealth.
7. MUKERJI, B. B.—Co-operative Rural Welfare.
8. ORNE, ANDRES.—Co-operative Ideals and Problems.
9. BRAHMA, K. V.—The Law of Co-operative Societies in India and Burma.
10. GIDE CHARLES.—Consumers Co-operative Society.
11. BAROU, N.—Co-operative Banking.
12. PANTALU, RAM DAS.—Year Book and Directory of Indian Co-operation, 1942.
13. MAHESH CHAND.—Co-operation in China and Japan.
14. BAROU, N.—Co-operation in the Soviet Union.
15. DIGBY, MARGARET.—Digest of Co-operative Law at Home and Abroad.

16. The Co-operative Movement and Present Day Problems (Published by the International Labour Office.)

17. Report of the Co-operative Planning Committee.

Paper XVII—*Marketing.*

Significance of marketing. Evolution of marketing organization and practice—conditions prior to the Industrial Revolution; modern industrial and commercial developments; changes in marketing organisation and methods.

The characteristics of the market—Meaning of the term market; a perfect market; an organized market; different concepts of the market (place organization, price-making); classification of buyers and sellers; classification of goods; factors that control a market; importance of co-ordinating production with demand.

Marketing functions: The marketing process, concentration and dispersion; buying, selling, transportation, storage, grading, finance, and risk-bearing functions.

Methods of wholesale distribution and operating problems of wholesales. Organized wholesale markets.

Methods of retail distribution and operating problems of retailers ; multiple shop system ; departmental stores ; co-operative stores, etc.

Methods of Mail Order business.

Methods of sales promotion ; Brands and Trade Marks ; Personal Selling ; Press and other forms of advertising.

Marketing of agricultural products with special reference to U. P. (Cotton, Wheat, Jute, Rice, Seeds, etc.) Co-operative marketing of Agricultural products in India.

Marketing of industrial goods.

Marketing of Shares and Securities.

Financing marketing activities.

Market risks and hedging.

Regulation of markets.

Government Marketing Organisation : Trade Commissioner.

Marketing Officers, their establishments.

Books recommended :—

1. CLARK, F. E.—Principles of Marketing.
2. SIMMAT.—Principles and Practice of Marketing.

3. THOMAS RUSSELL —Commercial Advertising.
4. E. DRIES. — The Money, and the Stock and Share Markets.
5. MARSHALL.—Industry and Trade Selected chapters only).
6. MARSHALL.—Readings in Industrial Society (Chapters on marketing only).
7. CONVERSE.—Elements of Marketing.
8. PYLE.— Principles of Marketing.
9. HUSSAIN.—Agricultural Marketing in Northen India.
10. Report of the Agricultural Commission, (relevant portions only.)
11. Report of the Central Banking Enquiry Committee (relevant portions only.)
12. Report of the Provincial Banking Enquiry Committee (relevant portions only.)
13. Report of the Jute Enquiry Committee (relevant portions only).
14. Report of the Indian Central Cotton Committee.

15. Reports of the Government of India issued by the Marketing Officer.

16. Marketing by K. L. Govil.

Paper XVIII—*Mathematical Statistics.*

Theory of Probability :

Calculation of Probabilities, Multiplication and Addition of Probabilities, Mathematical Expectation. The Law of Large Numbers, Bayes' Theorem and Inverse Probability.

Frequency Distributions :

Binomial Frequencies. The Arithmetic Mean, Mode, and Standard Deviation. The Normal Frequency Curve. Skew-Normal Frequency Curves. Measures of Variation and Kurtosis. Logarithmic Transformations of the Normal Curve. Application to the Graduation of Statistical Data. Lexis Ratio. Cumulative Distributions.

Problems of Sampling :

The Application of Sampling to the Collection of Statistics, to Agricultural Problems, and to Business Specifications. Sampling Experiments. The Probable Error. Tests of Significance. The Theory of Error. Least Squares. The Theory of Small Samples. Samples in a Finite Universe.

Curve Fitting :

Problems of Curve Fitting. Straight Lines, Parabolas, Hyperbolas, Exponential and Logarithmic Curves, the Logistic Curve and other Ogive Curves. Goodness of Fit. Chi-Square Statistics.

Correlation :

Mathematical Theory. Coefficient of Correlation, Correlation Ratio and Lines of Regression. Correlation Surface. Non-linear Regression. Partial Correlation. Multiple Correlation. Biserial, Tetrachoric, and other Special Methods of finding Correlation. Graphical Correlation.

Time Series :

Methods of Isolation of Seasonal Variations, other Cyclical Fluctuations, and Secular Trends. Harmonic Analysis and the fitting of wave curves to Statistics.

Index Numbers :

Test of Index Numbers, Index Numbers of Prices, Production, Wages, and Real Wages.

Association :

Contingency Tables. Tests of Independence and Association. Partial Association and Illusory Association.

Interpolation :

Methods of Interpolation and Extrapolation. Inverse Interpolation. Interpolation in tables of double entry. The Calculation of Finite Differences. Graduation by Empirical Formulae. Forecasting of Economic Phenomena.

Econometrics :

The Derivation of Demand Curves and Surfaces. Cost of Production Curves.

List of Books Prescribed—

BOWLEY, A. L. : Elements of Statistics (latest edition).

YULE AND KENDAL : Introduction to the Theory of Statistics.

FISHER, R. A. : Statistical Methods for Research Workers.

MILLS, F. C. : Statistical Methods applied to Economics and Business.

FISHER, IRVING : The Making of Index Numbers.

Sankhya (Journal of Indian Statistical Institute.)

Journal of Royal Statistical Society, London.

EZEKIEL, M: Correlation Analysis.

SCHULTZ, HENRY: The Theory and Measurement of Demand.

KENDALL, M. G.: The Advance Theory of Statistics.

N. B.—Only those students who had taken paper X—Theory and Practice of Statistics, in the M. A., Previous Examination, will be permitted to offer this paper in the M. A., Final Examination.

Paper XIX—*Thesis*.

Paper XX—Special subject for detailed study such as Famines, Trade cycles, etc., to be announced each year.

History — Previous

There shall be four papers and a *viva voce* test—

Paper I.—Modern Political Theory ; and Constitutions of England, United States of America, Italy and Australia.

Books recommended :—

FORD, A : Introduction to Politics.

BRYCE : Modern Democracies (Chapters on the U. S. A. .

BARKER : Political Thought in England from Herbert Spencer to the Present Day.

LASKI : Introduction to Politics.

MUNRO : The Governments of Europe.

BUELL : New Governments of Europe.

SIDNEY LOW : The Governance of England
(New Edition .

Paper II. —*Either* (a) Europe from 1815 to 1878.

Books recommended :—

Cambridge Modern History, Vols. X and XI.

HAZEN : Europe, since 1815.

SEIGNOBOS : A Political History of Contemporary Europe since 1814.

ANDREWS : The Historical Development of Modern Europe.

OGG AND SHARP : Economic Development of Modern Europe.

or

(b) Contemporary Europe (1871-1939).

Books recommended :—

GOOCH : History of Modern Europe.

HAYES : Social and Political History of Modern Europe, Vol. II, new edition, 1932.

WALLACE : Thirty Years of Modern History.

GIBBONS : Introduction to World Politics.

OGG AND SHARP : Economic Development of
Modern Europe.

Paper III.—British History from 1688 to the
present day.

Books recommended : —

TREVELYAN : England under the Stuarts.

ROBERTSON : England under the Hanoverians.

MARRIOT : England since Waterloo.

EGERTON : Short History of English Colonial
Policy.

POLLARD : Evolution of Parliament.

ROBERTSON : Constitutional Documents of
English History in the XVIII Century.

Oxford History of England (relevant volumes).

Paper IV.—Either (a) Ancient India, from 600
B. C. to 184 B. C.

Books recommended : —

BENI PRASAD : The State in Ancient India.

MOOKERJI, R. K. : Chandra Gupta Maurya and
His Times Shamasastri Kant ; by as
Arthasāstra—Merindale series.

BHANDARKER, D. A. : Asoka.

MCCRINDLE : Ancient India as described by
classical writers.

JAYASWAL, K. P. : Hindu Polity.

MAJUMDAR, R. C. : Corporate Life in Ancient India.

FICK : Social Organisation in North-Eastern India in Buddha's Time.

Cambridge History of India, Vol. I, Chapters 4 to 12, 16 and 19.

R. K. MOOKERJI : Hindu Civilization, Chapters IV—VII.

DR. P. K. ACHARYA : Elements of Hindu culture and Sanskrit Civilisation.

Note.—This includes both practical, social and constitutional History of the Period.

or

(b)—History of the Delhi Sultanate from 1200 to 1526. (The history of the provincial dynasties is excluded).

Books recommended :—

ELLIOT AND DOWSON : History of India, Vols. II, III, IV and V.

AIYANGAR, KRISHNASWAMI : South India and her Muhammadan Invaders.

Ibn Batuta's Travels.

HABEEB : Campaigns of Alaud dīn Khilji.

Cambridge History of India, Vol. III.

ISHWARI PRASAD : History of the Qarauna
Turks.

or

(c) History of India 1748 to 1805 including the history of the establishment of the European Commercial companies.

Books recommended :—

FORREST G. W. : Clive, 2 Vols.

S. C. HILL : Bengal 1756-57—Introduction.

FORREST G. W. : Selections from the Records of the Government of India in the Foreign Deptt. 1772-85, Warren Hastings, Vol. I.

FORREST G. W. : Selections from the Records of the Government of India in the Foreign Deptt. 1785-93, Cornwallis.

OWEN S. J. : Selections from Wellesley's Despatches

DODWELL : Dupleix and Clive

MALLESON : History of the French in India.

CHATTERJI N. L. : Mir Qasim

CHATTERJI N. L. : Vereist's Rule in India.

DAVIES C. C. : Warren Hastings and Oudh.

ASCOLI : Early Revenue Administration of Bengal.

ROBERTS : India under Wellesley

KINCAID : History of the Marathas, Vol. II.

OR

(d) Contemporary India 1858 to 1930.

Note.—Students offering this paper in M.A. Previous must offer Group D in M. A. Final. The books are the same as for Paper II Group C. M.A. Final.

History—Final

Candidates will be required to offer one of the following Groups, (A, B, C or D) in addition to a common Essay paper and *viva voce* examination

Group A.—Ancient India.

Paper I—History of India, 185 B.C. to 319 A. D.

Books recommended :—

STEN KONOW : Corpus Inscriptionum Indicarum, Vol. II, Part I.

D. C. SIRCAR : Select Inscriptions, Vol. I.

PERCY GARDENER : Catalogue of the coins of the Greek and Scythian Kings of Bactria and India in the British Museum.

E. J. RAPSON : Catalogue of the coins of the Andhra Dynasty, the Western Ksatrapas, the Traikūṭaka dynasty and the Bodhi Dynasty in the British Museum

ALLAN : Catalogue of Ancient India Coins in the British Museum (1936.)

V. A. SMITH : Catalogue of coins in the Indian Museum, Vol. I.

CUNNINGHAM : Coins of Ancient India.

MCCRINDLE : Ancient India as described by Ptolemy.

MCCRINDLE : Ancient India, as described by Classical writers.

SCHOFF : Periplus of the Erythraean Sea.

TARN, W. W. : History of the Greeks in Bactria and India.

JAYASWAI, K. P. : History of India, 150 to 350 A. D.

Paper II.—Ancient India 320 to 650 A. D.

Books recommended :—

FLEET : Gupta Inscriptions.

SIRCAR, D. C. : Select Inscriptions.

RAI CHAUDHARI : Political History of Ancient India (Relevant Chapters).

ALLAN : Gupta Coins.

SMITH, V. A. : Early History of India, 4th Edition. (Relevant Chapters).

WATERS : On Yuan Chwang.

MOOKERJI : Harsha.

GILES : Fa Hien.

BANERJI, R. D. : The Age of the Imperial Guptas.

B. SAK, R. G. : The History of North-Eastern India (Chapters I—VII).

GAURISHANKAR CHATTERJI : Harshavardhan.

R. S. TRIPATHI : History of Kanauj.

SALETOR : Life in the Gupta Age.

R. K. MOOKERJI : The Gupta Empire.

ALTEKAR AND MAZUMDAR : New History of India.

Gupta Samrajya ka Itihasa by Pandit Basudeva Upadhyaya.

Note.—Paper I and II include political, Social and constitutional History of the period.

Paper III.—Archæology including Epigraphy, Numismatics, Art Architecture, Sculpture, Painting.

Books recommended :—

The Imperial Gazetteer of India, Vol. II, pp 1-201.

BUHLER : Indische Palaeographie (English Translation in Indian Antiquary, Vol. XXXIII).

OJHA : The Palaeography of India.

COOMARSWAMY, DR. : History of Indian and Indonesian Art, London, 1927.

GRUNWEDEL : Buddhist Art in India, translated by Gibson, London, 1901.

MITRA, P. : Pre-historic India.

MARSHALL, J. : Mahanjo-Daro and the Indus Civilisation, Vol. I, Chapters I to 8.

RAPSON : Indian Coins.

ALLAN : Cat. Ind. Conis.

SMITH : Catalogue of the Indian Coins in the Indian Museum, Vol. I.

MACKAY, E. : The Indus Civilisation.

CHAKRAVARTY, S. K. : Study of Ancient Indian Numismatics.

VOGEL : Buddhist Art.

DR. P. K. ACHARYA : Introduction to Ancient Indian Architecture according to Silpa Shastra.

N.B.—Students who have offered Paper IV (a) Ancient India in M.A. Previous must offer Group A in M. A. Final.

Group B.—Mediæval India.

Paper I.—Babur to Shahjahan, 1526 to 1657.

Book recommended :—

Memoirs of Babur, trans. by Beveridge

GUIBADAN BEGUM : Humayun Namah.

ELLIOT AND DOWSON : History of India, Vols. IV, V, VI.

Akbarnamah, trans. by Beveridge.

Muntakhab-ut-Tawarikh, Badauni, trans. by Lowe. Vol. II.

BLOCHMANN AND JARRET : Ain-i Akbari.

MORELAND : India at the death of Akbar.

MORELAND : Agrarian System of Muslim India.

ROGERS AND BEVERIDGE : Memoirs of Jahangir.

HODIVALA : Mughal Numismatics.

BENI PRASAD : History of Jahangir.

SAKSENA, B. P. : Shah Jahan.

QANUNGO : Dara Shikoh.

Paper II.—Alamgir I to Alamgir II, 1658 to 1761.

Books recommended :—

ELLIOT AND DOWSON : History of India.
Vols. VI and VII.

MORELAND : India from Akbar to Aurangzeb.

KINCAID AND PARASINS : History of the Marhatta People. Vols. I and II.

SARKAR : History of Aurangzeb.

SARDESAI G. S.—New History of the Maratha People.

IRWIN : Later Mughals.

SARKAR : Fall of the Mughal Empire.

SINHA : Rise of the Peshwas.

HUSAIN : Nizamulmulk Asaf Jah.

Paper III Cultural History of Northern India
from 1200 to 1700.

Books recommended :—

PERCY BROWN : Indian Painting under the
Mughals.

FERGUSON : History of Eastern Architecture,
Vol. II.

SMITH, V. A. : History of Fine Arts.

BADAONI : Muntakhab-ut-Tawarikh, Vol. III

TITUS : Indian Islam.

CARPENTER : Theism in India.

Dabistan-i-Mazaheb. Troyer and Shea.

Cambridge History of India, Vol. III, Chapter
on Art.

MUHAMMAD HABEEB : Amir Khusrau.

TARA CHAND : Influence of Islam on Indian
Culture.

TRIPATHI R. P. : Some Aspects of Muslim Administration in India.

KUNWAR MUHAMMAD ASHRAF : Life and Condition of the People of Hindustan.

N.B.—Students who have offered Paper IV (b) Mediæval India in M.A. Previous must offer Group B in M.A. Final.

Group C.—Modern India.

Paper I. – History of India, 1805 to 1857.

Books recommended :—

PRINSEP : Political and Military Transactions in India.

The Private Journal of the Marquiss of Hastings.

MAICO M : Political History of India.

LORD COLEBROOKE : India under Lord Ellenborough.

LEE WARNER : Life of Dalhousie, 2 Vols.

DURAND : First Afghan War.

MEHTA : Lord Hastings and the Indian States.

GUPTA P. C. : Baji Rao II.

CUNNINGHAM : History of the Sikhs.

KAYE : Administration of the East India Company.

KAYE : History of the Sepoy War, Vol. I.

COLLIETT : Life of Raja Ram Mohan Roy.

Paper II.—History of India, 1858 to 1939.

Books recommended :—

BOSWORTH SMITH : Life of Lord Lawrence,
Vol. II.

HUNTER : Earl of Mayo, 2 Vols.

LADY BALFOUR : Lord Lytton's Indian Administration.

WOLFE : Marquiss of Ripon, Vol. II.

LOVAT FRASER : India under Curzon and After.

BUCHAN : Lord Minto.

C. C. DAVIES : The Problems of the North-West Frontier.

AMIR ABDUR RAHMAN : An Autobiography.

YOUNGHUSBAND : India and Tibet.

MUKERJI, P. : Indian Constitutional Documents.

Report on Indian Constitutional Reforms, 1918.

PRASAD, B. : Origins of Provincial Autonomy.

MAZUMDAR, A. C. : Indian National Evolution.

CHINTAMANI, C. Y. : Indian Politics since the Mutiny.

LEE WARNER : The Native States of India.

SURENDRANATH BANERJI : A Nation in Making.

MASANI : Dadabhai Naoroji.

Paper III.—Social and Economic History of Modern India.

Books recommended :—

DUTT, R. C. : Economic History of India in the Early British Rule.

DUTT, R. C. : Economic History of India in the Victorian Age.

GADGIL : Industrial Evolution of India.

ANSTEY : Economic Development of India.

BANERJI, P. : Indian Finance in the days of the Company.

P. BANERJI : History of Indian Taxation.

STRACHEY : Finances and Public Works of India.

MISRA, B. R. : Land Revenue Policy of the United Provinces.

FARQUHAR : Modern Movements.

BASU, P. N. : History of Hindu Civilisation under British Rule.

ZACHARIAH : Renascent India.

N.B.—Students who have offered Paper IV(c) Modern India in M.A. Previous must offer Group C in M.A. Final.

Group D.—Asiatic History.

Paper I — Modern China and Japan

Books recommended :—

SUN-YAT-SEN : The International Development of China.

NO-YOUNG PARK : Making of a New China.

LARTO UETTE, K. S. : The Development of China

GUBBINS, J. H. : The Progress of Japan.

UYEHARA, G. E. : The Political Development of Japan.

YOSHI S. KUNO : Japanese Expansion of the Asiatic Continent, 3 Vols.

STIMSON, H. L. : The Far-Eastern Crisis.

Paper II.—Afghanistan, and Persia, etc.

Books recommended :—

SYKES, SIR PERCY : A history of Afghanistan.

BROWN, E. G. : Persian Revolution.

FRASER, D. : Persia and Turkey in Revolt.

CURZON LORD: Persia and the Persian Question

CURZON LORD : Russia in Central Asia.

RAWLINSON, H : England and Russia in the East.

Paper I I.—Turkey and Egypt.

Books recommended :—

MERS, E. G. : Modern Turkey.

DAVIS, W. S. : A Short History of the Near East.

PRICE, C : The Rebirth of Turkey.

TOYNBEE , A. J : Turkey.

CROMER, LORD : Modern Egypt.

COLVIN SIR A. : The Making of Modern Egypt.

CHIROL, SIR V : The Egyptian Problem.

SYMONS, M. T. : Britain and Egypt.

N.B.—In lieu of the Essay (Paper IV) and *viva voce* in the M.A. Final, a student may submit a dissertation on a subject approved by the Head of the Department on the recommendation of the teacher concerned.

Political Science—Previous**M. A. Previous.**

There shall be four papers and a *viva voce* test.

PAPER I—Either, (a) Ancient and Mediaeval Political Theory.

Syllabus : The Political Thought of Plato's predecessors, Plato's political philosophy according to the Republic, the Statesman, and the Laws, Aristotle's Politics. Political Thought after Aristotle The Stoics and the Epicureans, Early Christian Thought—St. Augustine. Mediaeval Political Thought and Feudalism. The relations of the Empire and the Papacy and controversies between the Imperialists and the Papalists from the 11th to the 14th century. The thought of the Conciliar epoch.

Books recommended :

PLATO : The Republic (Tr. Jowett).

ARISTOTLE : Politics.

E. BARKER : Plato and His Predecessors.

HEARNshaw : Social and Political Ideas of
Great Mediaeval Thinkers.

GIERKE : Political Theories of the Middle Ages,
translated by Maitland.

FIGGIS : From Gerson to Grotius.

M. D. FOSTER : Plato and Hegel.

C. H. Mc ILWAIN : The growth of Political
Thought in the West.

Or

(b) Contemporary Political Thought.

Neo-Idealism. Socialism. Pragmatism, Plu-
ralism. Fascism.

Books recommended :—

MERRIAM, BARNES AND OTHERS : Recent Poli-
tical Theories.

ELIOT : Pragmatic Revolt in politics.

LASKI : Communism.

BERTRAND RUSSELL : Power.

HSIAO : Political Pluralism.

STALIN : Leninism.

GRAHAM WALLAS : Human Nature in Politics.

WATSON : The State in Peace and War.

DUGUIT : Law in the Modern State.

KRABBE : The Idea of the Modern State.

MISS M. P. FOLLETT : The New State.

PAPER II—Modern Political Theory.

Syllabus : The beginnings of the Political Thought during the Renaissance in Italy. The Reformation and the Political Thought of the period of religious conflicts. Political Theories of the seventeenth century with special reference to the Contractualists. The Historical School and the theories of the period of Enlightenment. The Utilitarians. The German Idealists and their English followers in the nineteenth century.

Books recommended :—

HOBBS : Leviathan.

LOCKE : On Civil Government.

ROUSSEAU : The Social Contract.

MILL : Representative Government.

GREEN : Lectures on the Principles of Political Obligation.

BOSANQUET : Philosophical Theory of the State.

DUNNING: Political Theories, vols. I, II, III.

SABINE: History of Political Thought.

HOBHOUSE: The Metaphysical Theory of the State.

ALLEN: Political Theory in the 16th Century.

HEARNshaw: The Political Theories of the Renaissance and Reformation.

VAUGHAN: Studies in Political Theory.

COKER: Recent Political Thought.

PAPER III.—Ancient and Mediaeval Political Institutions.

Syllabus.—The Rise and Development of the Ancient City-State. The Roman Empire and Provincial Administration. The Papacy and the Holy Roman Empire. Feudalism. Mediaeval guilds and cities. Development of English Constitution during the Middle Ages.

Books recommended:—

SIDGWICK: Development of European Polity.

GREENIDGE: Greek Constitutional History.

GREENIDGE: Roman Public Life.

ADAMS: Civilisation during the Middle Ages (Chapter on Feudalism).

JENKS : Law and Politics during the Middle Ages.

HOMO : Roman Political Institutions.

VINOGRADOFF: Historical Jurisprudence, Vol. II.

The Cambridge Mediaeval History (Chapters on Feudalism and the Cities and the Roman Catholic Church).

PAPER IV.—Modern Constitutions. England
Australia, South Africa, the
United States of America, Japan,
Turkey, Italy, Russia.

Books recommended :—

IVOR JENNINGS : Cabinet Government.

BROGAN : The American Political System.

KEITH : Governments of the British Empire.

BRYCE : Modern Democracies.

HEIGENBERG : Major Comparative European Governments.

QUIGLEY : Government and Politics of Japan.

SPENCER : Government and Politics of Italy.

LASKI : Parliamentary Government in England.

STRONG : The New Soviet Constitution.

BUELL : New Governments of Europe.

TOYNBEE AND KIRKWOOD : Turkey.

RAMSAY MUIR : How Britain is governed.

Political Science

M.A.—FINAL.

There shall be four papers and a *viva voce* test.

PAPER I is compulsory. Besides this, each candidate shall offer any one of the groups A—F.

PAPER I.—Essay.

GROUP A.

PAPER II.—Ancient Indian Political Thought and Institutions.

Syllabus.—Vedic Political organisation and Political ideas. Political theories and practices as gleaned from the Epics, Sutras and Jātakas. Mauryan Political Organisation. Political ideas of the Arthasāstras, Dharma Sāstra and Purānas. Andhra, Gupta and Vardhana Administrations. General features of Political life from the 8th to the 12th Century A. D. Chola Administration.

Books recommended :—

1. MAHABHARATA : Sānti Parvan, Rājādharm-
ānusāsana Parvan (Tr. P. C. Roy).
2. KAUTALYA : The Arthasāstra (Tr. Shama-
sastry).
3. Cambridge History of India, Vol. I,
Chapters IV, V, XIX.
4. BENI PRASAD : Theory of Government in
Ancient India (Post-Vedic).
5. BENI PRASAD : The State in Ancient India.
6. KRISHNASWAMI AIYANGAR : Ancient India
(Chapter on Chola Administration).
7. JAYASWAL, K. P. :—Hindu Policy.

Paper III.—Ancient Indian Social Thought and
Institutions.

Syllabus.—Vedic Society. Social ideas and
practices in the Epics, Sūtras and Jatakas. Bud-
dhist and Jaina Social theories. The Social
philosophy of the Dharma Sāstras and Artha Sāstras.
Development of Caste. Position of Women. Regu-
lations on Marriage.

Books recommended :—

1. Mahabharata, Sānti Parvan (Tr. P. C. Roy).

2. *Manu Samhitā* (Tr. Bühler or Gangānātha Jhā).
3. *Arthasāstra* (Tr. by Shamasastri).
4. FICK : Social Organisation in North-Eastern India in Buddha's Time.
5. MAJUMDAR : Corporate Life in Ancient India.
6. Cambridge History of India (Chapters IV, V, VIII, IX, X, XI, XVI, XIX.).

Paper IV.—Ancient Indian Ethics.

Books recommended :—

1. *Kathopanishad* (Tr. Max Muller).
2. *Mahābhārata, Sānti Parvan* (Tr. P. C. Roy).
3. *Dharmasūtra of Apastamba* :
Prasna 1, *Patala* 1.
Prasna 1, *Patala* 2, *Khandas* 1—8.
Prasna 1, *Patala* 4, *Khandas* 13, 14.
Prasna 1, *Patala* 7, *Khandas* 20—23.
Prasna 2, *Patala* 1, *Khanda* 2.
Prasna 2, *Patala* 2, *Khanda* 5.
Patala 3, *Khanda* 7.

Patala 4, Khandas 8—10.

Patala 9, Khandas 21 to 24.

4. Dharmasūtra of Gautama (Chapters II, V, VII, VIII, X, XVIII).
5. Dharmasūtra of Vasistha (Chapters I, V, VI, VIII, IX, X).
6. Dharmasūtra of Baudhāyana :
 Prasna II, Adhyāya 6, Khanda 11.
 Prasna II, Adhyāya 10, Khanda 17.
 Prasna III, Adhyāya 12.
7. Dharma Sāstra of Manu (Chapters I, IV, VI, X, XI, XII).
8. Yājñavalkya (with special reference to Apaddharma Prakaranam, Vānaprasthā Prakaranam, Yati Prakaranam and Prāyaschitta Prakaranam of the Prāyaschittādhyāya).
9. GANGANATHA JHA : Philosophic Discipline.
10. HOPKINS : Ethics of India.
11. MACKENZIE : Hindu Ethics.
12. RANADE, R. D. : A Constructive Survey of Upanishadic Philosophy, (Chapters VI, VII).

GROUP B.

Paper V.—Islamic Political Thought and Polity till 1258.

Syllabus.—Islamic Idea of Government Forms of Government. Khilāfat. Imāmat. Imārat. Saltanat. Kingship. Divine Right of Kings Republic. Election. King : his qualifications and duties. King and subjects. The subjects : their duties towards King and State. Civic rights and responsibilities. Ministers and Provincial and Local administrations.

Books recommended :—

Cambridge Mediæval History of Europe (Vol. II, Ch. X ; Vol. III, Ch. XVI ; Vol. IV, Ch. X, A and B.

KHUDA BAKHSH : Contributions to the History of Islamic Civilisation.

ABUL FAZL : Ain-i-Akbari (Chapter I).

IBN KHALDUN : Muqqaddamaih.

MACDONALD : Development of Muslim Jurisprudence, etc.

AGHINIDES : Theories of Musalman Finance.

ARNOLD : The Caliphate.

KHUDA BAKHSH : Arab Civilisation.

ABDUR RAHIM : Muslim Jurisprudence (Chapter on Public Law.)

HITTI : Studies in Islamic Jurisprudence.

Paper VI.—Islamic Political Thought and Polity after 1258.

Books to be recommended later.

Paper VII.—Islamic Law and Jurisprudence.

Syllabus : Muslim Law : its classification. The sources of Law and their interpretation. Juristic Deduction. Constitutional and Administrative Law. Procedure and Evidence in Courts.

Books recommended :—

1. ABDUR RAHIM : The Principles of Muhammadan Jurisprudence.
2. JUNG, M. U. S. : The Administration of Justice in Muslim Law.
3. MARGOLIOUTH : Hibbert Lectures on the Development of Islam.
4. AMEER ALI : Muhammadan Law.
5. AMEER ALI : Spirit of Islam.
6. MACDONALD : Development of Jurisprudence, etc.

GROUP C.

PAPER VIII.—Social Anthropology.

Books recommended : —

1. GOLDENWEISER, A. A. : Early Civilization.
2. HOBHOUSE, L. T. ; Wheeler, S. C. ; Ginsberg, M.—The Material Culture and Social Institutions of Simpler Peoples.
3. WISSLER, CLARK : Man and Culture.
4. KROEBER, A. L. : Anthropology.
5. MARETT, R. R. : The Making of Man.
6. WAITZ, W. D. : An Introduction to Anthropology.
7. MARETT, R. R. : Anthropology.
8. RIVERS, W. H. R. : Social Organization.
9. LOWIE : Primitive Society.
10. FRAZER, J. G. : The Golden Bough (one volume edition).

PAPER IX.—Social Psychology.

Books recommended :—

1. McDOUGALL : The Group Mind.
2. McDOUGALL : Social Psychology.
3. GRAHAM WALLAS : Human Nature in Politics.

4. GINSBERG : Social Psychology.
5. BERNARD, L. L. : An Introduction to Social Psychology.
6. RIVERS, W. H. R. : Psychology and Politics.
7. THOULESS, R. H. : General and Social Psychology.
8. LAPIERE, R. T., AND FARNSWORTH : Social Psychology

PAPER X.—Social Philosophy.

Books recommended :—

- 1 MACKENZIE, J. S. : Outline of Social Philosophy.
2. HOBHOUSE, L. T. : Elements of Social Justice.
3. HOBHOUSE L. T. : Social Development.
4. MUIRHEAD AND HEATHERINGTON : Social Purpose.
5. CARENTT : Morals and Politics.
6. HOCKING, W. E. : Man and the State.
7. FOLLETT, M. P. : The New State.
8. MCIVER, R. M. : Community.

GROUP D.

PAPER XI—International Affairs 1815—1919.

1. Importance of International Affairs as a Separate Study. Nature of International Relations. Elements of International Relations. Forces or Factors behind International Relations.
2. Nationalism—its theory, principles and ideals.
3. Nationalism and Internationalism at the Congress of Vienna. The development of Nationalism 1815—1870. The Holy Alliance and the Concert of Europe. The Era of National Domination 1870—1918. The Triple Alliance and the Triple Entente. The Hague Conference of 1899 and 1907. The Balkan Problem and the World War I.
4. Imperialism or Colonial Policy—
Characteristics of the Old Colonial System. The Second British Empire. The Eastern Question. The New Colonial Policy. The Partition of Africa and Oceania—Chartered Companies. China

and the European Powers with especial reference to Extra-territoriality
The rise of Japan as a Modern Power.
United States and the Monroe Doctrine
Its policies (1) as regards Europe (2)
Central and Latin America and (3)
The Far East.

Development of industry and imperialism
Division of Africa, Colonisation of
Australasia etc. Domination over
the East by Russia, France, Great
Britain, etc.

Books :—

1. GIBBON : Introduction to World Politics.
2. PARKER MOON : Imperialism and World Politics.
3. TREAT : The Far East.
4. HAYES : Nationalism.
5. MARRIOTT : The Eastern Question.
6. MARRIOTT : Europe and Beyond.
7. WOOLF : Economic Imperialism.

PAPER XII.—Contemporary International Affairs :—
1919—1945.

1. The Peace Settlement of 1919.

2. Wilson's Fourteen Points and the League of Nations.

3. The Work of the League.

(a) The Peaceful Settlement of International Disputes.

(b) Social and Humanitarian Activities.

(c) The Mandate System with special reference to Iraq and Palestine.

(d) The Problem of Minorities.

(e) The Permanent Court of International Justice.

(f) International Labour Organization.

(g) Attempts at Disarmament (including the various Naval Conferences from 1921 to 1936).

4. The Foreign Policies of Britain, France, Germany, Italy, Soviet Russia and Turkey.

The Breakdown of Collective Security and World War II. The Atlantic Charter, The San Francisco Conference and U. N. Organisation.

5. United States in the Family of Nations. The Third British Empire—Imperial Federation or Imperial Cooperation—

Dominion Status and the Statute of Westminster. Britain and Egypt. Italy and Abyssinia. The Problems of the Pacific—Japanese Monroe Doctrine. United States and the Far East. Its Latin American Policy.

Books :—

1. HARDY : A History of International Affairs
(Revised edition.)
2. SCHUMAN : International Politics.
3. DRUMMOND : Ten Years of World Co-
operation.
4. MADARIAGA : Disarmament.
5. FRED A WHITE : Mandates.
6. ZIMMERN : The Third British Empire.
7. ROYDEN MAUDE : The Problem of Palestine.
8. MAIR : The Problem of Minorities.
9. The Problems of Peace Series.

PAPER XIII.—International Law.

Books recommended :—

LAWRENCE : Principles of International Law.

HALL : International Law.

(Or)

OPPENHEIM : International Law.

GARNER : Recent Developments in International Law.

PITT COBBETT : Leading Cases on International Law.

FENWICK : International Law, (Latest edition).

GROUP E.

PAPER XIV.—Either,

(a) Administration with special reference to India and England.

Books recommended :—

LAHIRI AND BANERJI : New Constitution of India.

The Defence of India (General Publicity Bureau).

G. N. JOSHI : Indian Administration.

Report of the Royal Statutory Commission, Vol. I, Memorandum submitted by the Government of India to the Commission.

BLUNT : The I.C.S.

FINER : The British Civil Service.

ALLEN : Bureaucracy Triumphant.

HEWERT : The New Despotism.

A. K. GHOSH : Public Administration in
India.

For reference : Provincial Government Reports submitted to the Royal Statutory Commission.

Finer : Theory and Practice of Modern Government (Chapters on the State Activity and Civil Service).

The publications in the Whitehall Series on the various Departments.

Or (b) American Administration and Institutions.

Or (c) Administration and Institutions of U.S.S.R.

PAPER XV.—Local Self-Government in India
England, the United States and
Germany.

Books recommended :—

K. T. SHAH : Constitution and Functions of
Indian Municipalities.

MUNRO : Government of European Cities.

MUNRO : Government of American Cities.

WELLS : German Cities

FINER : English Local Government.

LASKI AND OTHERS : A Century of Municipal Progress.

ROBSON : Local Government in England.

KEITH : Constitutional History of India.

Simon Commission Report, Vol. I.

Niemeyer Report.

FINER : The British Civil Service.

OGG : English Government and Politics.

The Foreign and Home Offices, Ministry of Health, Board of Trade, Ministry of Labour and the Treasury in the Whitehall series.

PAPER XVI.—Economic Activities of the State.

Syllabus.— Principles of State participation in economic enterprise, *Laissez-faire*, State control and Nationalization.

Social Insurance, Workmen's Compensation, Old Age, Invalidity and Maternity.

Unemployment, a brief study of causes and remedies, and State assistance especially applicable to India

Factory, Mines and Shipping Legislation, and Machinery for inspection.

Regulation of Production ; adulteration of food and drink—Ghee, Milk, etc.—drugs narcotics. Excise and Opium policy and State control and regulation. Pharmaceutical education and compilation of Indian Pharmacopœia.

Government regulation of Prices and Monopolies—normal and abnormal, in times of war, famine or other calamities. Regulation of Produce, Exchanges, Grading, Prevention of speculation—Cotton, wheat, etc.

State aid to industries—a study of methods. State control of Public Works and Public Utility.

Services—Roads and Bridges, Railways, Posts, Telegraph, Telephone and Broadcasting Services, Aviation, Agencies of control.

The League of Nations—The Health Committee, the Committee on White Slave Traffic—and the International Labour Organisation.

State and Public Research and information. Direct participation and other methods of assistance.

N.B.—This paper will be studied with special reference to India. Reference to Foreign countries is to illustrate the principles and methods.

Books recommended :—

HAROLD LASKI : Grammar of Politics (Economic Institutions).

H. T. HADLEY : The Economic Problems of Democracy.

A. C. PIGOU : Economics of Welfare (Specified chapters to be indicated).

H. A. SILVERMAN : Economics of Social Problems.

H. R. SEAGER : Social Insurance.

A. C. PIGOU : Industrial Fluctuations (Specified Chapters).

Relevant Chapters in the Report of the Royal Commission on Labour.

PIGOU : Unemployment.

VISHWESHWARAYYA : Economic Planning for India. Report of the U. P. Unemployment Committee.

Jayakar Committee Report on Road Transportation in India.

W. PATON : Opium in India.

Indian Factory Acts, Mining Acts, Annual Reports on Factory and Compensation Acts,

Maternity Benefit Acts. Provincial and Indian States Committees Reports on Unemployment ; Government of India Central Board of Revenue Memorandum on Alcohol Question, 1925 ; Indian Excise Committee Report, 1905-06 ; United Provinces Excise Report, 1921. Reports of the League of Nations and the International Labour Organisation.

Government and other publications will be indicated as the course proceeds during the Session.

GROUP F.

Paper XVII—Same as Paper VIII.

Paper XVIII—Indian Anthropology.

Books :—

1. GHURYE—Race and Caste in India.
2. HUDSON—Primitive Culture of India.
3. The Ethnographic Volume of the Census of India Report.
4. CHANDA—The Indo-Aryan Races.
5. GUIFFRIDA RUGGERI—Systematic Anthropology of Asia (Tr. by H. C. Chakladar.)
6. MITRA—Pre-historic India.

7. BUXTON—Peoples of Asia.
8. IYER, L. K. A.—Lectures on Ethnography.
9. ROY, S. C.—Caste Race and Religion in India.
10. BAGCHI—Pre-Aryan and Pre-Dravidian in India.
11. Census Reports on Caste and occupation.
Paper XIX. Sociology.

Books:—

1. HAYES : Sociology.
2. FAIRCHILD : Foundation of social life.
3. GIDDING : Principles of Sociology.
4. GINSBERG : Sociology.
5. BUSTEE : Principles of Sociology.
6. BERNHARD : The Field and methods of sociology.
7. DR. MUKERJI : The field and methods of Sociology.
8. LICHTENBERGER : Development of Social Theory.
9. WEISS AND BECKER : Systematic Sociology.

10. SOROKIN : Contemporary Sociological Theories.

Diplomacy and International Affairs.

The course in Diplomacy and International Affairs will be a post-graduate course of two years.

There shall be eight papers and a *civa-voce* test both in the Previous and Final. There will be a qualifying test in the languages in M. A. Previous.

Diplomacy and International Affairs—Previous.

Paper I—Contemporary International Affairs 1919—1945. As for M.A. Final in Politics Paper XII.

Paper II—Diplomacy : History and Technique — consisting of (a) History of Diplomacy 1815—1919. As for M.A. Final Politics Paper XI. (b) The Technique of Diplomacy.

Papers III and IV—A study of one of the following countries : (a) Great Britain (b) U. S. A. (c) U. S. S. R. (d) China (c) France.

Paper III—Geography and Economics.

Resources—Natural and Human. National Character.

Economic Life and Structure—Agriculture Industry, Transport and Communication, Labour Organization, Cooperation, Fiscal Policy, Banking and Credit, Public Finance, Trade—Inland and Foreign, National wealth and income. Trends of development.

Paper IV—Constitution, Social and Cultural Life.

Political System : Government machinery, Constitution, Administration, Parties, Press, Public opinion, Local Self-Government.

Society and Culture : Religion, Social divisions and classes, Amusements, Sports, Theatre, Music, Cinema, Literature, Science, Philosophy, Universities, Education. Home life.

Diplomacy and International Affairs—Final.

Paper V—International Organization—U.N.O., International Organizations, etc.

Paper VI—International Law—as for M. A. Final Politics Paper XIII.

Paper VII—A study of one of the following regions : (a) The Near East and Middle

East (b) The Far East (c) Central European and Danubian region (d) America (e) Western Europe.

Paper VIII—One of the following languages :
French, Chinese, Arabic, Russian,
Spanish.

Mathematics

(Same as for the M.Sc. Examination.)

Geography

M.A. Previous Examination.

There shall be four papers carrying 100 marks each as follows :—

1. Geomorphology.
2. Climatology including Oceanography.
3. Economic Geography including Human. Geography.
4. Cartography. (The Examination in this paper shall be entirely practical and *viva voce*, conducted by one internal and one external examiner. It is obligatory to pass in this paper.)

M.A. Final Examination.

The following papers, of 100 marks each, shall be set :—

1. History of the Development of Geography and Geographical Discoveries.
2. Political Geography of the World.
3. India.
4. Selected continents ; one from each of the following groups.

Group I

- (i) Europe.
- (ii) Asia Excluding India.
- (iii) Africa.

Group II

- (i) North America.
- (ii) South America.
- (iii) Australia.

Europe and North America will be selected for the present.

A *viva voce* examination carrying 100 marks will be held in addition to the written papers.

The following books are recommended for M.A. Previous Examination :—

Books recommended :—

Paper I .

DAVIS, W. M. : Geographical Essays.

GEIKIE, JAMES : Earth Sculpture.

HENDERSON, JUNIUS : Geology and its Relation to Landscape.

HOBBS, W. H. : Earth Evolution and its Facial Expression.

HOBBS, W. H. : Earth's Features and their meaning.

SALISBURY, R. D. : Physiography.

SCHUCHERT, CHARLES, AND LE VENE : The Earth and its Rhythms.

TARR AND MARTIN : College Physiography.

HAYFORD, JOHN F. : The Earth, from the Geophysical Standpoint.

JEFFREYS, HAROLD : The Earth.

WEGENER, A. : The Origin of Continents and Occans.

CHAMBERLAIN, T. C. : The Origin of the Earth.

Do. The Earth, its Figure and Constitution.

DALY, R. A. : Our Mobile Earth.

WOOLDRIDGE AND MORGAN : An Outline of Geomorphology.

W. W. WATT : Geology for Beginners.

Unstead and Tylor : Physical Geography.

Paper II.

BRUNT, DAVID : Meteorology.

HUMPHREYS, W. J. : Physics of the Air.

MC ADIE, ALEX. : The Principles of Aerography.

MILHAM, W. I. : Meteorology.

TALMAN, CHARLES F. : The Realm of the Air.

VAN CLEEF, EUGENE : The Story of the Weather.

VISHER, S. S. : Climates Laws.

MILLER, AUSTIN : Climatology.

KENDREW : Climates of Continents.

SHAW, SIR NAPIER : Forecasting of Weather.

MARMER, M.A. : The Sea.

JENKINS, J. T. : A Text-Book of Oceanography.

JOHNSTONE, JAMES : A study of the Oceans.

HINKS : Meteorology for Beginners.

LAPMAN : Course of Meteorology.

Paper III.

BENGTSON AND VON ROYEN : Fundamentals of Economic Geography.

CHISOLM : Handbook of Commercial Geography.

SMITH, R. : Industrial and Commercial Geography.

SMITH, R. : The World's Food Resources.

ZIMMERMAN : World Resources and Industries.

HUNTINGTON AND CAUSHING : Business Geography.

HUNTINGTON, WILLIAMS AND WALKENBURG : Economic and Social Geography.

LIPPINCOTT : Economic Resources and Industries of the World.

PRATT : International Trade in Staple Commodities.

ROBBINS : Plants Useful to Man.

HUNTINGTON AND CARLSON : Geographic Basis of Society.

VIDAL DE LA BLACHE : Principles of Human Geography.

BEWS, J. W. : The World's Grasses.

CAMPBELL, B. H. : An Outline of Plant Geography.

HARDY, M. E. : The Geography of Plants.

NEUBEGIN : Animal Geography.

PACK : Forests and Mankind.

SCHIMPER, A. F. W. : Plant Geography (Tr. by Fisher).

ZON AND SPARHAWK : Forest Resources of the World.

PAUL DE HEAVY : World Wheat Planning and Economic Planning. Oxford University Press.

Paper IV

Ordnance Survey of England : A Text-Book of Topographical Surveying.

Beaman, W. M. : Topographic Mapping.

Deets and Adams : Elements of Map Projections.

RAISZ : Cartography.

DWERRYHOUSE, A. R. : Geological Maps ; their Interpretation and Use.

ELLES, G. E. : The study of Geological Maps.

STEERS : Maps Projections.

ORMSBY AND JAMESON : Mathematical Geography.

STAMP : Land Utilization Survey in Britain.

Books recommended for M.A. Final

Paper I.

BAKER : History of Geographical Discoveries and Exploration.

HOWARTH AND DICKINSON : Making of Modern Geography

SPILHAUS : Background of Geography.

Paper II

BOWMAN : The New World.

FAWCETT : Political Geography of the British Empire

FLEURE : Geographical Background of Modern Problems.

FEBVRE : Geographical Introduction to History.

BOWMAN : Limits Land Settlement.

MACKINDER : Democratic Ideals and Reality.

OGILVIE : International Waterways.

KAECKENBECK : International Rivers.

HOLDITCH : Boundaries in Europe and the Near East.

FAWCETT : Frontiers ; a study in Political Geography.

LYDE : Some Frontiers of Tomorrow.

SEMPLE : Influences of Geographic Environments.

Relevant portions from Paper III :—

STAMP : Asia [Methuen.]

LYDE : The Continent of Asia.

BERGSMARK : Economic Geography of Asia.

MUKERJEE : Economic Geography of India.

DUBEY : Economic Geography of India.

ANSTEY : Trade of the Indian Ocean.

SIMKINS : Agricultural Geography of the Deccan Plateau.

GORER : Himalayan Village.

SEWELL : Geographic and Oceanographic Research in Indian Waters.

WADIA : Geology of India.

KRISHNAN : Geology of India.

BLANDFORD : Climate and Weather of India.

ELLIOT : Rainfall of India.

BALL : Coalfields of India

PUGH AND DUTT : Crop Production in India.

HOWARD : Crop Production in India.

Imperial Gazetteer of India.

Indian Year Book.

Paper IV.

Europe :

VALKENBURG AND HUNTINGTON : Europe.

HUBBARD : Geography of Europe.

BLANCHARD AND GISH : Geography of Europe.

BLANCHARD AND VISHER : Economic Geography
of Europe.

BOGARDUS : Economic Geography of Europe.

PRICE : Economic Problems of Europe.

LYDE : Continent of Europe.

ORMSBY : France.

PARTSCH : Central Europe.

NAUMANN : Central Europe (Tr. by Meredith).

COLE : Geological Growth of Europe.

FLEURE : Human Geography in Western Europe.

FLEURE : The Peoples of Europe.

WRIGHT : Geographical Basis of European History.

History.

North America :—

RUSSEL SMITH : North America.

RUSSEL : North America.

JONES AND BRYAN : North America.

BAKER : Agricultural Regions of North America.

BENETT : The Soils and the Agriculture of the Southern States.

BRIGHAM : The United States of America.

Doctor of Philosophy (Arts)

(See Ordinances in Chapter XXXV-D, pp. 34-41.)

Doctor of Letters

(See Ordinances in Chapter XXXV-E, pp. 42-49.)

Doctor of Philosophy (Commerce)

(See Ordinances in Chapter XXXVIII-C, pp. 98-106.)

Doctor of Letters in Economics

(See Ordinances in Chapter XXXVIII-D.
pp. 106-113.)

B.Sc. EXAMINATION**English Literature**

There will be two papers and a *viva voce* test.

Paper I—An Essay on a subject of general interest (maximum marks 40) and questions on unseen passages (maximum marks 35).

The following books are recommended :

WESTAWAY : The Writing of Clear English.

TREBLE and VALLINS : The A B C of English Usage.

DIXON : Dictionary of English Idioms.

FOWLER : The King's English (abridged edition).

MURISON : English Composition (C. U. P.)

MAIR : The Writing of English.

McMORDIE : English Idioms.

DENISON ROSS : This English Language.

Paper II—General English.

Any one of the following :—

(i) LYSAGHT : A Reading of Life.

(ii) RUSSELL, BERTRAND : The Conquest of Happiness.

(iii) BARKER, ERNEST : The Values of Life.

(iv) GALSWORDY, J : Short Stories.

Questions will be put on an Unseen passage and Idiom and Usage. (Max. Marks 35)

viva voce—A test of general reading, and of command over the language (Max. Marks 35).

N.B.—(a) A journal of general reading for two years shall be kept by each student, and submitted periodically to his seminar teacher ;

(b) The journal should be brought to the *viva voce* Examination by the candidate himself, and should be returned to him by the Examiners ;

(c) At least *six* books mentioned by the candidate in the Journal should be written in the English language, and shall be of general interest.

Mathematics.

There will be three papers :—

Paper I.—*Algebra, Trigonometry and Analytical Geometry of two dimensions.*

Inequalities, elementary theorems on convergence and divergence of series, binomial theorem for any rational index, exponential and logarithmic series, partial fractions, simple continued fractions and easy determinants.

Trigonometry :

De Moivre's theorem, summation of simple trigonometrical series, expansions of simple trigonometrical functions in power series and hyperbolic functions.

Analytical Geometry of two dimensions :

Straight lines, circles, parabola, ellipse and hyperbola, treated by rectangular, oblique and polar co-ordinates.

Paper II.—*Differential Calculus. Integral Calculus and Differential Equations :*

Differential Calculus.

Limits, differentiation of a function of a single variable, successive differentiation, use of Taylor's and Maclaurin's theorems, indeterminate forms, maxima and minima of a function of a single variable, partial differentiation, tangents, normals, asymptotes, double points, points of inflexion, curvature, evolutes and involutes, envelopes, and simple curve tracing.

Integral Calculus :

Standard forms, integration by substitution, by parts and by other simple methods, simple reduction formulæ, rectification, quadrature, surfaces and volumes of solids of revolution.

Differential Equations :

Ordinary equations of 1st order (including orthogonal trajectories but excluding singular solutions) and linear equations with constant coefficients.

Paper III.—*Statics and Dynamics and either Hydrostatics or Astronomy :*
Statics :

General conditions of equilibrium of a particle and of a rigid body under the action of forces in one plane, principle of virtual work, friction, centre of gravity and simple machines.

Dynamics :

Velocity and acceleration, Newton's laws of motion, work and energy, rectilinear motion Hooke's law, projectiles in vacuum, circular and harmonic motions, simple and cycloidal pendulum, and impact.

Hydrostatics :

Fluid pressure, centre of pressure in simple cases, total and resultant pressures on immersed surfaces, equilibrium of floating bodies (excluding meta-centre, and stability). Properties of gases, determination of heights by barometer and simple machines.

Astronomy :

A brief history of Astronomy up to the invention of the telescope ; observed movements of the heavenly bodies ; early explanations. Fundamental definitions ; transit circle ; detection and mechanical

correction of errors of adjustment ; clock, its error and rate ; determination of right ascension and declination ; equatorial ; measurement of small angular distances by photography ; theodolite. Refraction= $k \tan z$ deduced on Cassini's hypothesis ; determination of k by observation ; shape of sun's disc near horizon. Ecliptic ; Flamsteed's method for finding the right ascension of a star ; Kepler's law (enunciation) ; synodic period of planets elongation of planet from the sun when it is stationary. Parallax in zenith distance ; determination of the distance of moon by simultaneous observations at two observatories ; distance of the sun by observation of Eros, and of nearer stars by trigonometrical method. Precession in longitude ; physical cause ; nutation in obliquity ; calculation of ancient dates by precession. Cause of aberration ; it varies as sine of Earth's way Equation of time ; it vanishes 4 times a year, sidereal time ; conversion of time ; summer time ; estimation of time by naked eye observation of stars ; measurements of time by meridian observations Gregorian calendar ; calendar reform ; equatorial sun-dial. Latitude by meridian observations ; longitude by wireless. Synodic and sidereal period of moon ; Meton's cycle ; *tithis* ; determination of height of lunar mountains. Cause of eclipses ;

size of earth's shadow at moon ; conditions for eclipses ; ecliptic limits' maximum and minimum number of eclipses in one year, Saros of Chaldeans. Lunar tides and their effect on the length of the day and month and the moon's orbit. A brief outline of the nebular hypothesis.

A knowledge of spherical trigonometry would not be required.

Mathematics (Honours)—1950

There will be six papers :

Paper I.—*Algebra, Trigonometry and Theory of Equations.*

Algebra :

In addition to the Pass course, summation of series and recurring continued fractions.

Trigonometry :

In addition to the Pass course, expansion of $\sin\phi$ and $\cos\phi$ as infinite products.

Theory of Equations :

General properties of equations, relations between roots and coefficient, symmetric functions of the roots, transformations of equations, algebraic solutions of cubics and biquadratics, n th roots of unity, properties of derived equations, limits of

the roots of equations, approximate solutions of numerical equations and determinants.

Paper II.—*Pure Plane Geometry and Analytical Geometry of two and three dimensions.*

Pure Plane Geometry :

Ranges and pencils, cross ratios, projections orthogonal and conical, Desargue's theorem, harmonic properties of simple figures, and polars, and other simple projective properties of conics' circular points at infinity, reciprocation. Pascal's and Brianchon's theorems.

Analytical Geometry of two dimensions :

In addition to the Pass course, reduction of the general equation of the 2nd degree to standard forms and system of conics.

Analytical Geometry of three dimensions :

Planes, straight lines, properties of conicoids and confocal conicoids referred to principal axes, plane sections, generating lines and reduction of general quadrics to standard forms.

Paper III.—*Differential Calculus, Integral Calculus and Differential Equations.*

Differential Calculus :

In addition to the Pass course, rational and irrational numbers, sequences and limits, concept

of a function, continuity, differentiability, the mean value theorem, Taylor's theorem, maxima and minima of functions of two or more variables change of variables.

Integral Calculus :

In addition to the Pass course, Reimann's definite integral, mean value theorems, improper integrals, definite integrals involving Beta and Gamma functions, change of variables and of order of integration multiple integrals with simple applications, Green's theorem, use of Fourier's series.

Uniform convergence and term by term differentiation and integration of series.

Differential Equation :

In addition to the Pass course, singular solutions linear equations of 2nd order, variation of parameter, homogeneous and exact equations.

Relevant portions from the following books are recommended—

Carslaw : Fourier Series and Integrals.

Goursat-Hedrick : Mathematical Analysis,
Vol I.

Hardy : Pure Mathematics.

Murray : Differential Equations.

Paper IV.—*Elements of Vectors, Statics and Hydrostatics.*

Elements of Vectors :

Fundamental notions, addition, subtraction multiplication and division of vectors, simple geometrical and mechanical applications.

Statics :

In addition to the Pass course, graphical statics in two dimensions, forces in three dimensions, virtual work, stability and centre of gravity, Attractions and potentials of rods, discs, spheres and circular cylinders. *Hydrostatics.*—As in the Pass course.

Paper V.—*Dynamics of a Particle and Rigid Dynamics in two dimensions.*

Dynamics of a Particle in two dimensions :

In addition to the Pass course, motion in a resisting medium, hodograph, constrained motion, central orbits and disturbed elliptic motion.

Rigid Dynamics in two dimensions :

Moments of inertia, D'Alembert's principle and motion in two dimensions.

Paper VI.—*Either*

(a) *Spherical Trigonometry and Spherical Astronomy.*

Or

(b) *Electricity and Magnetism.*

Spherical Trigonometry :

Simple relations between trigonometrical functions of the sides and angles of a spherical triangle, solutions of triangles, areas, and properties of spherical triangles.

Spherical Astronomy :

Systems of co-ordinates and their determination figure of the earth, astronomical instruments, diurnal and annual motions of the earth, twilight, the seasons, Kepler's laws, refraction, Parallax, aberration, precession, nutation, motion and phases of the moon eclipses, equation of time, reduction and conversion of time, determination of terrestrial latitude and longitude.

The course is approximately indicated by the relevant portions of Smart's Spherical Astronomy.

Electricity and Magnetism :

Properties of potentials, lines of force, dielectrics, condensers and conductors, images, applica-

tion of methods of inversion and Spherical Harmonics to electrostatic problems. Steady currents in linear conductors. Permanent and Induced Magnetism. The Magnetic Field produced by Electric currents. Induction of currents in linear circuits.

MARKS

Six papers of 125 = 750

PHYSICS

The examination will consist of two papers and a practical test.

For the year 1948, the subjects of the papers will be—

- | | | |
|--|---------|-----------|
| (1) General Properties, Sound and Heat | .. .. . | 50 Marks. |
| (2) Light, Electricity and Magnetism | 50 | „ |
| (3) Practical Test | .. .. . | 50* „ |

General Properties of Matter.—Units and dimensions. Planetary motion. Mean, Solar and sidereal time. Rotational inertia. Simple and com-

* 10 marks out of 50 marks of the B.Sc. Practical Examination will be set apart for the record of Practical work done by the candidate during the course of the two years of his study for the examination.

pound pendulums. Laws of gravitation. Determination of 'G.' Elementary problems on attraction. Potential and its calculation in a few simple cases. Hooke's law. Young's modulus. Rigidity. Bulk modulus. Bending of rods. Elementary ideas of surface tension phenomenon.

Viscosity and diffusion. Air pumps and manometers.

Sound.—Wave motion. Propagation of sound waves. Reflection, refraction and diffraction of sound waves. Kinematics of simple harmonic motion. Composition of vibrations. Lissajous' figures. Beats. Free, damped and forced vibrations of simple systems. Equations of wave motion. Stationary waves. Velocity of transverse wave in a string. Possible modes of vibration of strings with fixed ends. Vibration of sound board. Velocity of sound in different media. Effect of temperature and humidity. Doppler's principle. Vibration of air columns. Organ pipes. Recording and reproduction of sound. Non-harmonic vibrations of bars, membranes, plates, (simply the results). Chladni's figures. Experimental study of forced vibrations, and resonance. Consonance, temperament and Diatonic scale. Determination of velocity, frequency and wave-length. Simple applications of acoustical principles to direction finding

and sound ranging. Elementary ideas about the acoustics of halls.

Heat.—Construction and theory of thermometers. Pyrometry. Calorimetry. Elementary ideas of the Kinetic theory of gases. Van der Waals' Equation. Change of State. Vapour Pressure. Liquefaction of gases. Coefficients of expansion. Conductivity of solids, liquids and gases. Carnot's and other heat engines. First and Second laws of Thermodynamics. Entropy. Absolute scale. Simple thermodynamic formulæ Radiation. Kirchhoff's law. Experimental study of total and spectral radiation. Radiation Pyrometry. Elementary meteorology.

Light.—Velocity of Light. Photometry. Reflection and refraction at plane and spherical surfaces. System of lenses. Elementary ideas on defects of image. Aberrations and their removal in telescopes, microscopes, eye-pieces and other optical instruments. Human Eye. Rainbow.

Wave theory of Light. Reflection and Refraction of Light. Interference of Light. Newton's rings and colours of thin films. Michelson's Interferometer. Applications of interference of Light. Diffraction of Light. Zone plate. Plane

and concave gratings. Production of spectra by prisms gratings and their dispersive and resolving powers. Polarisation of Light. Double refraction in uniaxial crystals. Plane, circularly and elliptically polarised light. Rotation of the plane of polarisation. Use of polarimeter. Spectroscope and spectrum analysis. Simple Bohr's theory of Hydrogen spectrum. Elementary ideas of Scattering of Light.

Magnetism.—Lines and tubes of force. Potential due to small magnets and magnetic shell. Determination of magnetic moment. Determination of the horizontal and vertical components of the Earth's field. Angles of dip and declination. Magnetic Induction. Susceptibility. Permeability. Ferro-, para., and diamagnetism. Gauss' Theorem. Terrestrial magnetism.

Electricity.—Proof of Coulomb's law. Dielectric constant. Quadrant and Absolute electrometers. Electroscopes. Calculation of potential, capacity and energy of simple electrical systems. Frictional and induction machines. The electric current. Primary, secondary and standard cells. Galvanometers, ammeters, voltmeters, and other electrical measuring apparatus. Determination of high and low resistances. Wheat-stone's Bridge. Carey Foster's Bridge. Joule's law. Determination of electromotive force and its calculation from

thermochemical data. Electrolysis and electrochemical equivalents. Thermoelectric phenomena. Electromagnetic phenomena. Electromagnetic Induction. Induction coil. Growth and decay of current, Alternating currents. Simple A. C. circuits. Vector diagrams and use of imaginary quantities. Vibration galvanometer. Units, Ampere, Volt, Farad, Ohm, Watt. Absolute measurement of current and resistance. Elementary theory of dynamo, motor and transformer. Generation and detection of electromagnetic waves : their relation to light. Triod valve and its uses. Discharge of electricity through gases. Cathode rays. Measurements of e/m and e . Positive rays. Isotopes. X-rays. Elements of Radio activity. Photo-electricity.

Experiments : —

1. Determination of Young's modulus by—
 - (i) Stretching.
 - (ii) Bending of a bar.
 - (iii) Vibration.
2. Determination of modulus of rigidity by—
 - (i) Static method.
 - (ii) Dynamic method.

3. Moment of inertia of—
 - (i) Fly-wheel.
 - (ii) Rectangular lamina.
 - (iii) Any solid by means of torsion pendulum.
4. Experiment with the compound Pendulum.
5. Spiral Spring.
6. Determination of surface tension by capillary rise method.
7. Kundt's Tube.
8. Sextant.
9. Determination of refractive index by total internal reflection.
10. Spectrometer, (i) Determination of the refractive index of the prism, (ii) Calibration of the spectrometer, (iii) Wave length of light by diffraction grating, (iv) Dispersive power of prisms.
11. Focal length of combination of lenses.
12. Photometry.
13. Polarimeter.
14. Bi-prism.

15. Newton's rings.
16. Specific heat by steam calorimeter.
17. Constant pressure air thermometer.
18. Mechanical and electrical determination of J.
19. Thermal conductivity.
20. Ratio of Specific heats of gases by Clement and Desormes' apparatus.
21. Determination of H.
22. Carey Foster's Bridge.
23. Use of post office box.
24. Resistance of (i) Cell, (ii) Galavanometer, (iii) Accumulator, (iv) Ammeter, (v) Voltmeter.
25. Platinum Thermometer.
26. Potentiometer and its applications.
27. Determination of E. C. E. of copper.
28. Comparison (De-Sauty) and absolute measurement of capacities.
29. Self-Inductance.
30. Mutual Inductance.

31. Calibration of meters.
32. Practice with a single valve receiving set.
33. Study of model dynamo.
34. Thermoelectric curve.
35. Measurement of magnetic field by search coil.
36. Characteristic curve of a triode valve.
- {
 37. Determination of viscosity of a liquid.
 38. Velocity of sound using oscillator.
 39. Use of nodal slide.
 40. Verification of Brewster's law.

Physics (Honours)—1950

The Syllabus is printed in the Prospectus for 1946.

Physics (Honours)—1951

There will be five papers and a practical examination.—

- (1) (a) General Properties of Matter.
(b) Mechanics of solids and fluids including vibrations and wave motions and elements of aerodynamics.
- (2) Heat (Kinetic theory of gases, thermodynamics and internal combustion engines).

(3) Light.

(4) Electricity and Magnetism.

(5) Electron Theory.

The following is the detailed syllabus :—

(In addition to what is included in the Pass course).

General Properties of Matter :

Surface tension phenomena. Thin films. Viscosity of liquids and gases. Lubrication. Compression of liquids and gases. Modern pumps. Fourier's Theorem.

Mechanics of Solids and Fluids :

Vibrating systems with illustrative examples of strings, Air columns, Resonators, etc., Forced vibrations and maintenance. Mechanics of solids—its application to bending of bars, helical springs, cylinders and plates. Waves and ripples. Wave motion in gases. Acoustical measurements and instruments. Applications of Acoustics.

Elements of Aerodynamics :

Aeroplane: Various components and their functions. Principles of Flight: Lift, drag, etc. Flow round an aerofoil. Airscrew. Stability

and control. Instruments, Effect of altitude, Super-charging, etc.

Heat :

Measurement of high and low temperatures. Kinetic Theory of Gases. Mean free path. Transport phenomena, and molecular dimensions. Phenomena in gases at very low pressures. Andrews' experiments. Equations of state. Conductivity of solids, liquids and gases and its absolute determination. Six thermodynamic formulæ and their applications. Correction of gas thermometers. Thermodynamical functions. Equilibria of systems. Radiation. Deduction of Laws of radiation constant. Quantum theory of specific heat of solids and its verification. Radiation constants. Solar constant. Quantum theory of specific heat of solids and gases. Nernst's Heat theorem. Absolute value of entropy and chemical constant.

Internal Combustion Engines :

Various types and their development. Heat cycles and their application. Practical Limitations. Efficiency, etc. Ignition system.

Light :

Nodal points. Cardinal points. Interference of polarised light. Fresnel's theory of double

refraction in crystals. Spectroscopy of infra-red and ultraviolet. Series spectra. Elements of electromagnetic theory of light. Anomalous dispersion. Elementary knowledge of the effect of electricity and magnetism on light. Scattering of light. Anisotropy of molecules.

Electricity and Magnetism :

Measurement and production of high magnetic and electrical fields. Application of the method of electrical images to easy problems. Electrometers and Electroscopes. Methods of determining capacity and self and mutual inductances. Determination of Ampere, Ohm and Volt. Generators, Motors, Transformers, A. C. measuring instruments. Simple wireless receiving and transmitting sets.

Electron theory :

The electron. Determination of e/m and e . Positive ray analysis. Elementary notions of radioactivity. Scattering of α . and β . particles. The nuclear hypothesis. Theories of radioactivity. Scattering of X-rays. Compton effect. Photoelectricity. Bohr's theory and its generalisation. Radiation and ionisation potentials. Theories of magnetism. Electronic theory of metallic conduction. Structure of the atom.

Experiments :

- (1) Lift and drag of a flat plate.
KL. KD. LD. for at least 2 speeds.
- (2) Lift and drag of an aerofoil.
KL. KD. LD. for at least 2 speeds.
- (3) Resistance of Cylinders.
- (4) Resistance of spheres.
- (5) Drag and crosswind force on strut—
ordinary and streamlined.
- (6) Kater's Pendulum.
- (7) Modulus of torsion.
 - (a) Dynamical method.
 - (b) Statical method.
- (8) Viscosity of liquids and of gases.
- (9) Stroboscopic determination of frequency.
- (10) Kundt's tube.
- (11) Ratio of Specific Heats.
- (12) Conductivity of copper and glass by
Forbes' and Lees' methods respectively.
- (13) Calibration of a spectroscope.

- (14) Variation of refractive index of a liquid with temperature.
- (15) Polarimeter.
- (16) Resolving power of a telescope. Numerical aperture of a microscope.
- (17) Elliptically and circularly polarised light.
- (18) Platinum thermometer.
- (19) Standardisation of ballistic galvanometer.
- (20) Self-induction.
- (21) Mutual-induction.
- (22) Hysteresis curve.
- (23) Quadrant electrometer.
- (24) Law of total radiation (Stefan's Constant).
- (25) Constants of valves.
- (26) Practice with receiving sets.
- (27) Valve as an oscillator.

MARKS.

5 Papers of 100 each .. 500

Practical—

Class record	50	} 250
Practical	200	

Total ... 750

Chemistry

The examination in Chemistry will comprise of two papers and a practical examination. (a) that the first paper be divided into 3 compulsory sections; (A) (Inorganic), (B) Organic, and (C) (Physical). Section A shall carry 34 marks, section B shall carry 33 marks, and section C shall carry 33 marks; (b) that the 2nd paper be divided into two compulsory sections:— A (Organic) and B (Physical). Section A shall carry 35 marks, and B shall carry 15 marks. “that 10 marks out of 50 marks of the B.Sc., Practical Examination in Physics and Chemistry be set apart for the record of Practical work done by the candidate during the course of the two years of his study for the examination.”

Candidates must gain minimum pass marks in the practical examination as well as pass in the total of the papers in the science subjects.

Atomic theory, simple conceptions of the atomic structure, and electronic theory of valency, Avogadro's hypothesis and its application. Determination of equivalents. Specific heats of elements and compounds. Isomorphism. The periodic classification of elements. Methods of determining atomic and molecular weights. Kinetic theory of gases. Laws of mass action and its applications. Ionic theory of solutions. Osmotic pressure,

influence of solutes on freezing and boiling points. Laws of Electrolysis, electro-chemical equivalents, determination of conductivity, transport numbers, acidity of acids and bases. Elementary ideas about phase rule, catalysis, colloids, spectrum analysis and thermochemistry.

- (a) Elementary ideas about the following :—
different kinds of soil, carbon dioxide cycle, nitrogen cycle, fixation of nitrogen, improvement of soil by manures and fertilizers.
- (b) Ideas about the chemical analysis of the essential constituents of soil, manures and fertilizers.

Inorganic Chemistry.—The occurrence, preparation and properties of the following elements and their important compounds treated especially with regard to the periodic classification. Outlines of the main metallurgical processes of the metals indicated by an asterisk :—Hydrogen, Argon, Helium, Li, Na*, K*, Cu*, Ag*, Au*, Mg, Ca, Sr, Ba, Zn*, Cd, Hg*, B, Al*, C, Si, Sn, Pb*, N, P, As, Sb, Bi, O, S, Cr, F, Br, Cl, I, Mn, Fe*, Co, Ni*, and Pt*.

Practical Inorganic Chemistry.—Qualitative analysis of mixtures of substances containing not more

than five radicals positive or negative by dry or wet methods :—

Basic radicals.—NH., Na, K, Mg, Ca, Sr, Ba, Zn, Mn, Ni, Co, Al, Cr, Fe, Cu, Bi, Hg, Cd, As, Sb, Sn, Pb, Ag ; acid radicals :—CO₃, NO₂, S, SO, SO₄, F, Cl, Br, I, NO₃, ClO₃, CH₂ COO, borate, oxalate, phosphate.

Acidimetry and alkalimetry, idometry, using thiosulphate, arsenite, permanganate and dichromate-titration of iron with potassium permanganate and dichromate, standardisation of permanganate by oxalic acid.

Estimation of arsenious oxide and alkaline arsenites with iodine.

Estimation of silver ion by chloride ion (indicator chromate ion) and thiocyanate ion (indicator ferric ion).

Gravimetric estimation of Cu, Ag, Pb, Zn Fe, Cr, Ba, sulphate and chloride acid radicals.

Organic Chemistry.—The following indicates the scope of the Examination for the B.Sc. pass degree in organic chemistry. The comparison and relation of the typical carbon compounds, isomerism including optical isomerism, purification of organic substances, distillation and crystallisation. Criteria of

purity, for example, boiling point, melting point. Methods of ultimate analysis of organic compounds. Calculation of molecular weights from empirical formula. Constitutional formulæ.

The modes of occurrences, general methods of preparation, characters, constitutional formulæ of the saturated hydrocarbons up to 5 carbon atoms and unsaturated hydrocarbons up to 2 carbon atoms and the following monoderivatives of the saturated hydrocarbons :—

- | | | |
|---|---|---|
| (1) Halides. | } | containing up to
3 carbon atoms
only. |
| (2) Alcohols. | | |
| (3) Ethers. | | |
| (4) Aldehydes and ketones,
esters, acid chlorides,
anhydrides and | | |
| (5) Halides. | | |
| (6) Amino acids. | | |

Cyanogen and cyano-derivatives containing up to 3 carbon atoms only. Cyanacetic acid. Organometallic compounds of Zn and Mg and mercaptans up to 2 carbon atoms. In addition to the above the following derivatives have also to be studied:—Methylene chloride, methylene iodide, chloral, chloroform, iodoform, carbon tetrachloride

diethyl ether, glycol, glycerol, urea, the methyl and ethylamines, oils and fats (glycerides of palmitic, stearic and oleic acids), soap, butyric, oxalic, malonic, succinic, tartaric, malic glycollic, lactic and citric acids. General properties, occurrence and reactions of carbohydrates, glucose, fructose, saccharose, starch and cellulose.

The distinction between fatty and aromatic compounds. Benzene, toluene, action of chlorine on toluene, benzyl chloride, nitrobenzene, aniline, diazobenzene chloride and diazo reactions, benzaldehyde, benzoic acid, phthalic acids, benzene sulphonic acid, benzyl chloride, benzyl alcohol, salicylic acid, phenol, catechol, resorcinol, hydroquinone, pyrogallol, naphthalene *a* and *b* naphthalen sulphonic acids, *a* and *b* naphthol, *a* and *b* nitro-naphthalene, *a* and *b* naphthylamine pyridine.

Attention should be paid to the following manufacturing processes ;— Petroleum, industrial alcohol, glycerol and its nitro compounds, vinegar, soaps and candles, sugar (saccharose), paper, nitrocellulose, coal gas and coal tar distillation.

Practica Organic Chemistry.—Identification of C, H, N, S, P, and halogens qualitatively in organic compounds. Determination of boiling and melting points.

Identification of Common Organic Compounds.—Methyl and ethyl alcohols, glycerine, formaldehyde, acetaldehyde, acetone, formic and acetic acids, oxalic acid, tartaric acid, citric acid, ethyl ether, grape sugar, cane sugar, starch, chloroform, iodoform, chloral hydrate, urea, benzene, phenol, benzoic and salicylic acids, aniline, resorcinol, phthallic acid, nitrobenzene, naphthalene, pyrogallol, succinic acid, benzamide, acetamide, and acetanilide.

Chemistry (Honours)—1949

The Syllabus is printed in the Prospectus for 1945.

Chemistry (Honours)—1950

The Honours Examination in Chemistry will comprise of four papers and a practical examination. Paper I—Physical Chemistry; Paper II—Inorganic Chemistry; Paper III—Organic Chemistry; Paper IV—Historical. Analytical and Applied Chemistry. Candidates must gain minimum pass marks in the practical examination as well as pass in the total of the papers in Chemistry.

Physical Chemistry.—Atomic theory. Avogadro's Hypothesis and its application. Determination of equivalents. Specific heats of elements and compounds. Methods of determination of atomic weights. Kinetic theory. Specific heats at constant

pressure and constant volume. Determination of atomic weights of monoatomic gases. Behaviour of gases under high pressure. Liquefaction of gases. Van der Waal's equation. Critical point, methods of determining the critical constants. Vapour pressure, vapour densities. Dissociation and abnormal vapour densities. Application of Kinetic theory to dissociation of gases. Determination of vapour density. Additive properties of mixture of gases, of liquids and of solids. General properties of liquids. Vapour pressure, the boiling point. Vapour pressure and boiling point of mixed liquid (including pairs of nonmiscible and partially miscible liquids). Fractional distillation under reduced pressure.

The properties of dilute solution, osmotic pressure direct and indirect methods of determining osmotic pressure, relation between gases and osmotic pressure. Influence of solute on freezing and boiling points, determination of molecular weights of dissolved substances, molecular association and dissociation. Determination of molecular weights of liquids from their surface tension.

Electro-chemical character of the elements. The laws of electrolysis. Ionic and hydrate theory of solution. Velocity of ions, transport number. Determination of conductivity. Strength of acids

and bases. Action of one electrolyte on another containing a common ion, solubility product. Theory of indicators. Simple concentration cells.

Laws of mass action and chemical equilibrium. Chemical dynamics. Phase rule. Catalysis. Colloids. Photochemistry.

The relation between the physical properties such as boiling point, molecular volume, molecular refraction, molecular rotation of compounds, and their chemical composition and constitution.

Spectrum analysis. Elements of Radioactivity. Thermochemistry. Elements of crystallography. Elementary ideas about isotopes, isobars and structure of atoms.

Practical Physical Chemistry.—Determination of densities of gases, e. g., CO_2 ; determination of vapour density by Victor Meyer's method, determination of equivalents of Zn or Mg by displacement of hydrogen, determination of molecular weights of substances by boiling and freezing point methods.

Density of liquids. Determination of solubility. Viscosity. Spectroscope (identification of unknown elements by plotting wavelength curve with known elements that are volatile in the Bunsen flame).

Determination of partition coefficient. Heat of neutralization of acids and bases. Electric conductivity. Velocity of chemical reaction of the first order, *i. e.*, hydrolysis of methyl acetate in presence of HCl Velocity of inversion of cane-sugar by polarimeter.

Inorganic Chemistry.—

In addition to the pass course the following is added :—

The occurrence, preparation and properties of the following elements and their chief compounds studied from the standpoint of the periodic classification :—

Rare gases of the atmosphere, Rb, Cs, Be, Ra, Mo, Ti, Se, Te, In, Tl, Ce, Th, V, Om, W. U. Pd. Ir and Pt. Study of the Theory of valency, allotropy, elementary ideas on intermetallic compounds.

Practical Inorganic Chemistry.—

Besides what is prescribed for the pass course :—

(1) Quantitative analysis including volumetric determination involving the use of iodine and thiosulphate process, *e.g.*, Cu, H_2SO_3 , MnO_2 and bleaching powder.

(2) Gravimetric determination of Mn, PO_4 , Ca, Mg, Ni, Cr, CO_3 , C_2O_4 , NO_3 , by Lunge's Nitrometer, Ammonia (by direct and indirect methods).

Determination of ferrous and ferric iron in an ore. Qualitative and quantitative analysis of simple minerals such as dolomite, magnesite, calcspar, pyrites.

Analysis of silver, nickel and brass coins.

Preparation of carbonato-tetrammino-cobalt-nitrate Chloropentammino cobalt-chloride.

Simple gas analysis. Qualitative analysis of mixtures containing 6 radicals given in Pass Course including silicate and thiosulphate.

Organic Chemistry.—

Fuller treatment of the aliphatic hydrocarbons saturated and unsaturated both with their important allied compounds and derivatives such as alcohols, aldehydes, ketones, acids, amides, amines, cyanogen compounds, mercaptans, all these mono and poly with their ordinary and mixed derivatives and organometallic compounds.

Fuller treatment of the aromatic hydrocarbons with their important allied compounds and derivatives such as mono and poly-hydric, phenols,

alcohols, aldehydes and ketones, mono and polycarboxylic acids, nitro and amino compounds, sulphonic acids, amides, substituted hydrazines, azo and diazo compounds and also the ordinary and mixed derivatives of all the above compounds. Five and six membered heterocyclic compounds containing one hetero atom only and their derivatives. Monocyclic and olefinic terpenes. Azo pyronine, triphenylmethane, indigo and alizarin group of dye stuffs. Alkaloids of the pyridine and isoquinoline group. Aminoacids and proteins. Polymethylenes and derivatives.

Optical activity of carbon and nitrogen compound. Geometrical isomerism, tautomerism and condensation.

Practical Organic Chemistry.—

Detection of pure organic compounds containing C, H and O or N. Determination of hydroxy groups and estimation of molecular weight of simple organic acids and bases. Class work should also include the quantitative estimation of C, H, N, S and halogens : determination of methoxy, ethoxy, and carboxy groups.

Attention should also be paid to the following processes :—Esterification, acetylation, nitration, sulphonation, hydrolysis, reduction and oxidation.

Purification of organic compounds, distillation under reduced pressure, steam distillation, uses of filter pump and Buchner's funnel.

The following substances should also be prepared—ethyl bromide, nitrobenzene, aniline, ethyl oxalate, oleic acid, urea allyl alcohol, acetanilide tribromaniline, phenol, benzoic acid, benzene sulphonic acid, quinone, hydroquinone from quinone, diazonium salts. From naphthalene—naphthalene tetrachloride, phthalic acid, phthalic anhydride, fluorescein, eosin. Salicylic acid from phenol. Phenyl glucosazone, benzyl chlorid, Orange II, methyl orange.

HISTORY OF CHEMISTRY

- (a) Historical side of chemical development.
- (b) Personal side.

From the time of Boyle to the present time, short life and works of the following chemists :—

Boyle, Joseph Black, Scheele, Priestley, Cavendish, Lavoisier, Dalton, Davy, Berzelius, Faraday, Liebig, Pasteur, Hofmann, Berthlot, Thomsen, Cannizzaro, Mendeleef, Bunsen, Dumas, Graham, Victor Meyer, Ramsay, Curie, Moissan, Baeyer, Emil Fischer, van't Hoff, Arrhenius, Nernst, Roscoe and Wilhelm Ostwald.

Applied Chemistry —

A general knowledge of the following topics will be required :—Sugar manufacture, oils, artificial fibres, artificial manures, ceramics, paper and leather.

Analytical Chemistry.—

General principles of analytical Chemistry.
Books recommended :—All latest editions.

1. PARTINGTON : A Text-Book of Inorganic Chemistry.
2. HOPKINS : Chemistry of the Rarer Elements.
3. STEWART : Some Physico-Chemical Themes.
4. STEWART : Recent Advances in Physical and Inorganic Chemistry.
5. CLOWES AND COLEMAN : Quantitative Chemical, Analysis.
6. MOLLOW PERKIN : Qualitative Chemical Analysis.
7. FINDLAY : Practical Physical Chemistry.
8. LEWIS : A System of Physical Chemistry, Vols. I and II.

Or

9. TAYLOR : A Treatise on Physical Chemistry, Vols. I and II.

10. **BERNTHSEN AND SUDBOROUGH : A Text-Book of Organic Chemistry.**

The following books should also be consulted:—

1. **FRIEND : Text-Book of Inorganic Chemistry, Vols. I—X.**
2. **MELLOR : Comprehensive Treatise on Inorganic and Theoretical Chemistry.**
3. **COHEN : Organic Chemistry for Advanced Students. Vols. I, II and III.**
4. **Chemical Society Annual Reports.**
5. **COHEN : Practical Organic Chemistry.**
6. **CLARKE : Identification of Organic Substances.**
7. **THORPE AND WHITELEY : Manual of Organic Chemical Analysis.**

			MARKS
Four papers of 125 each	..	..	500
Practical—			
Organic	..	..	65
Inorganic	..	..	85
Physical	..	..	50
Record of Practical	..	..	50
Total			750

Zoology

The Examination shall comprise two papers and a Practical Examination. Candidates must obtain the minimum pass marks in the Practical Examination as well as in the total of the theory papers.

The following syllabus is prescribed :

General principles of Biology, treated in an elementary manner, including the theory of evolution with notions of variation, heredity, adaptation and Recapitulation hypothesis.

Elementary principles of Geological and Geographical distribution of animals.

Description of animal cell and tissues treated in some detail.

Asexual and sexual modes of reproduction, parthenogenesis ; alternation of generations and metamorphosis.

The structure, habit and development of the non-chordata as illustrated by—

Protozoa	.. Amoeba, Euglena, Paramoecium, Vorticella, Monocystis and Malarial Parasites.
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Porifera	.. Sycon.
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Cœlenterata	.. Hydra and Obelia.
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Platyhelminthes .. Tænia, Liverfluke or any other Distomum.

Nemathelminthes .. Ascaris.

Annulata .. Pheretima, Nereis and Leech.

Arthropoda .. Prawn, Periplaneta, Anopheles and Scorpion.

Mollusca .. Fresh-water Mussel (Anodonta or any other type) and Pond-Snail (Pila.)

Principal characteristics, structure and habits of Chordata as illustrated by—

A. ACRANIA :—

Hemichordata .. Balanoglossus.

Urochordata .. Ascidia or Herdmania.

Cephalochordata .. Amphioxus.

B. CRANIATA :—

Pisces .. Scoliodon or any other Elasmobranch.

Amphibia .. Frog.

Reptilia .. Lizard.

Aves .. Columba.

Mammalia .. General characters of Prototheria and Metatheria, as

illustrated by *Echidna* and *Kangaroo*, respectively. *Lepus* for rat, *Canis* (Skull only).

Outlines of the development of *Ascidia*, *Amphioxus*, Frog, Chick and Rabbit. Amnion and Allantois. Placentation.

Elementary physiology and histology of the various organs of the animal body, as illustrated by Frog and Rabbit.

Paper I shall comprise the Non-chordata: cell and tissue; the subjects of Reproduction and Histology, and general principles of Evolution.

Paper II shall comprise the Chordata, elementary facts about Embryology, Physiology, Geological and Geographical distribution.

Practical Course

Candidates will be required to show a knowledge of simple microscopic technique and to dissect and describe the following animals:—

Amœba, *Sycon*, *Paramœcium*, *Hydra*, *Obelia*, *Pheretima*, *Nereis*, *Leech*, *Prawn*, *Cockroach*, *Scorpion*. *Unio*, *Pila*, *Balanoglossus* (external features only), *Ciona*, *Amphioxus* (dissection omitted).

Scoliodon or any other Elasmobranch, Frog, Lizard, Pigeon and Rabbit or Squirrel.

Osteology of Dogfish, Frog, Lizard, Fowl, Rabbit. Dog's skull and Echidna (limbs and limb-girdles only).

Note-books containing a complete record of laboratory work must be produced at the practical examination.

Books recommended :—

1. PARKER AND HASWELL : Text-book of Zoology, (Macmillan & Co.) (Vols. I and II).
2. ADAMS : Introduction to the Vertebrates. John Wiley & Sons; New York.
3. BOURNE : Comparative Anatomy of Animals. Vols. I and II. G. Bell & Sons, Ltd., London.
4. WALTER H. E. : Biology of the Vertebrates. (Macmillan & Co.)
5. DENDY : Outlines of Evolutionary Biology, (Constable & Company, Ltd., London).
6. MARSHALL AND HURST : Practical Zoology, (Smith Elder .
7. KINGSLEY : Comparative Anatomy of Vertebrates, (John Murray, London).
8. BAHL : PHERETIMA ; Indian Zoological Memoirs (Methodist Publishing House, Lucknow).

9. THYLLIAMPALAM : SCOLIODON ; Indian Zoological Memoirs (Methodist Publishing House, Lucknow).
10. GOODRICH: Living Organisms. (The Clarendon Press, Oxford).
11. BENI PRASAD Pila—Indian Zoological Memoirs, (Methodist Publishing House, Lucknow).
12. An Introduction to Comparative Zoology by F. G. S. Whitefield and A. W. Wood, J. and A. Churchill, Ltd., London.
13. PRADHAN PALAEMON ; Indian Zoological Memoirs (Publishing House, Lucknow).

Zoology (Honours)—1949

The Syllabus is printed in the Prospectus for 1943.

Zoology (Honours)—1950

The course for Honours will include a detailed knowledge of the structure, development, bionomics and classification of all the representatives of the principal sub-divisions of each phylum of the animal kingdom, and their distribution in time and space.

A detailed knowledge of the animal cell and its phenomena and tissues. Various modes of reproduction.

The general principles of Biology comprising the various theories of Evolution and the subjects of Variation, Adaptation, Inheritance and Sex,

Practical Course.—Candidates will be required to show a detailed knowledge of microscopical technique, section cutting, and to describe and dissect representative types of the principal sub-divisions of each phylum of the animal kingdom.

Candidates must produce at the practical examination their preparations and note-books containing a complete record of laboratory work for which 50 marks are allotted.

There will be five papers :—

	Marks
Paper I—Protozoa to Annelida ..	100
„ II—Echinodermata, Arthropoda and Mollusca ..	100
„ III—Protochordata to Amphibia	100
„ IV—Reptilia, Aves and Mammalia	100 .
„ V—Cytology and general principles of Biology including theories of Evolution, Heredity and Sex ..	100
Practical (including class record) ..	250
Total ..	750

Botany

The examination in Botany will comprise two papers and a Practical examination. Candidates must gain minimum pass marks in the Practical examination as well as pass marks in the total of the papers.

The following syllabus is prescribed :—

1. The anatomy (including histology) of the vegetative and reproductive organs of the Phanerogams and Cryptogams treated from the comparative and functional standpoints. The cell contents and their microchemical reactions. An elementary knowledge of plant ecology.

2. The morphology, physiology and life-histories of—

THALLOPHYTA—

(a) Bacteria.

(b) Algæ.

Cyanophyceae—Nostoc, Oscillatoria.

Chlorophyceae—Chlamydomonas, Volvox,
Ulothrix, Spirogyra, Oedogonium,
Vaucheria.

Phaeophyceae—Ectocarpus, Fucus.

Rhodophyceae—Batrachospermum.

(c) Fungi—

Phycomycetes—Cystopus, Phytophthora, Mucor.

Ascomycetes—Sphaerotheca, Peziza, Saccharomyces.

Basidiomycetes—Ustilago, Puccinia, Agaricus.

BRYOPHYTA—

(a) *Hepaticae*—Riccia, Marchantia.

(b) *Anthocerotales*—Anthoceros.

(c) *Musci*—Sphagnum, Funaria.

PTERIDOPHYTA—

(a) *Equisetales*—Equisetum.

(b) *Lycopodiales*—Selaginella.

(c) *Filicales*—Marsilea, Pteris.

SPERMATOPHYTA—

(a) *Gymnosperms*—Cycas, Pinus.

(b) *Angiosperms*.

A detailed knowledge of the life-history of a typical flowering plant and a knowledge of typical representatives of the following families:

Ranunculaceae. Papaveraceae, Cruciferae Caryophyllaceae, Malvaceae. Rutaceae, Leguminosae.

Rosaceae, Umbelliferae. Convolvulaceae, Solanaceae. Labiatae, Acanthaceae, Compositae, Moraceae, Gramineae, Palmae, Liliaceae.

3. Plant Physiology—

- (a) Physiology of the cell.
- (b) Absorption of materials in general.
- (c) Ascent of sap and transpiration.
- (d) Assimilation of carbon in green and non-green plants. Assimilation of nitrogen.
- (e) Translocation of plastic food material.
- (f) Fermentation and respiration.
- (g) An elementary knowledge of the physiology of growth including turgidity.
- (h) Movements in Plants :—Growth movements and movements of variation.

4. An elementary knowledge of the general principles of Evolution, Variation and Heredity.

5. Economic Botany—An elementary knowledge of soils and gardening : field crops ; weeds of arable land and their control ; plants in relation to the more important industries (rubber, sugar, paper and some of the important timbers, fibres, and drugs.

Paper I—shall comprise the Morphology, Physiology and life-histories of the Cryptogams and Gymnosperms.

Paper II—shall comprise the Morphology and life-histories of the Angiosperms ; general Plant-Physiology ; Ecology ; Evolution, Variation and Heredity ; and Economic Botany.

Practical Course

The dissection of plants and parts of plants. The preparation, simple staining and study of microscopical section of plants and the principal varieties of plant tissues. Permanent preparations are not required.

A practical study of the typical plants enumerated under Section 2, the referring of plants and parts of plants to their appropriate position in any scheme of classification.

The description of plants and parts of plants in technical language.

Students will be expected to be familiar with simple physiological apparatus and experiments.

An elementary knowledge of Economic Botany is expected.

Note-books containing a complete record of laboratory work must be produced at the practical examination.

Marks will be allotted as follows :—

Class Record ..	.. 5
Practical Examination ..	45
	—
Total ..	50

Text-books recommended—

LOWSON AND SAHNI : Text-book of Botany
(Indian Edition).

SCOTT : Structural Botany, Vols. I and II.

STRASBURGER : Text-book of Botany.

COULTER, BARNES AND COWLES : Text-book of Botany.

JOHNSON, AMY : Text-book of Botany.

RANJAN, SHRI : Text-book of Plant Physiology.

Botany (Honours)—1949

The Syllabus is printed in the Prospectus for 1948.

Botany (Honours) 1950

Candidates for the Honours Examination will be required to pass in the written as well as in the practical examination separately.

1. The structure, life-history and affinities of the chief representatives of the principal groups and sub-groups of the Cryptogams and Gymnosperms.

2. General histology and microchemical reactions.

3. The external morphology, anatomy, life-history, taxonomy and affinities of the Angiosperms.

4. Genetics.

5. Plant Physiology ; metabolism, growth and movements.

6. Ecology—The Units of vegetation. Factors of the habitat. Plant Succession. Different types of vegetation with special reference to India.

7. Cytology—The structure of the cell ; the structure and functions of the nucleus ; the principal types of nuclear division ; the structure of the chromosomes ; the chondriome ; the plastids ; the vacuome ; the Golgi material.

There will be five papers :—

	Marks.
Paper I—Thallophyta ..	100
Paper II—Bryophyta and Pteridophyta ..	100
Paper III—Plant Physiology and Cytology	100
Paper IV—Gymnosperms and Genetics ..	100
Paper V—Angiosperms and Ecology ..	100

Practical Examination

The examination will deal with representatives of the chief classes of Cryptogams and Phanerogams, and with the technique connected with their study.

The description and the referring of plants and parts of plants to their families and their identification with the help of necessary books.

The general histology, preparation, staining and study of microscopical sections of plant-tissues. The uses of stains and other reagents. Microtomy.

Students will be required to set up experiments to demonstrate important phenomena in Plant Physiology.

An elementary knowledge of practical biochemistry will also be expected.

Preparations and note-books containing a complete record of laboratory work must be produced at the practical examination.

Marks will be allotted as follows:—

Class record	..	..	50
Practical Examination	..	..	200
			—
Total		..	250

MILITARY SCIENCE.

Paper I—

1. National Defence including the organization and administration of the Army in India.
2. Principles of war, including Naval and Air Strategy.
3. Economics of war, resources available for war, real and money costs of war, finance of war, taxes, loans, bank credit, effects of blockade and effects of war on economic structure and industrial organization.
4. The military history and allied geography of one of the following campaigns :—
 - (a) American Civil War—Shenandoah Valley Campaign—1861-62.
 - (b) Palestine Campaign—1914—1917.
 - (c) Mesopotamia Campaign—1914—1916 or 1916—1918.

Paper II—

1. Military Law, including Indian Army Act.
2. Organization of I. T. F.
3. Interior Economy and Regimental Duties.
4. Choosing and training the recruit, leadership and discipline.

Practical.

1. Map reading including contours.
2. Weapon training.
3. Appreciation, messages and operation orders.

Marks assigned :—

Paper I	..	..	50
Papee II	..	..	50
Practical	..	..	50
			<hr/>
	Total	..	150

Books recommended :—

Manual of Indian Military Law—Govt. Publication.

Regulations for the Army in India—Govt. Publication.

I. T. F. Act and Regulations—Govt. Publication.

BARTLETT : Psychology and the Soldier.

SCOTT : Approach to Economics.

WAVELL : Palestine Campaign.

MOBERLY : Official History of the War, Mesopotamia Campaign, Vols. I to IV.

MACMUNN : Military Operations, Egypt and Palestine.

KEARSEY : Notes and Lectures on the Campaign in Mesopotamia.

KEARSEY : Shenandoah Campaign.

COLE : Imperial Geography.

CROWTHER : The Sinews of War (Oxford University Press.)

BEVERIDGE : Blockade and the Civil Population (Oxford University Press).

CROWTHER : Paying for the War (Oxford University Press).

RICHMOND : The Naval Role in Modern Warfare (Oxford University Press).

SHEPHERD : The Military Aeroplane (Oxford University Press).

WAVELL : Generals and Generalship.

DEWING. The Army (National Defence Series published by William Hodge and Co.)

GOSSAGE : The Royal Air Force, National Defence Series (published by William Hodge and Co.)

COLE AND PRIESTLY : Outline of British Military History.

LIDDELL HART : Decisive Wars of History.

BOYCOTT : Elements of Imperial Defence.

FALL : Military History of the War in Palestine.

Syllabus for the B.Sc. Course for Women students.**(I)—SCIENCE***Paper I—Physiology*

Basic principles of Physiology—Cellular constitution of the body, Histological features of a common cell and specialised cell. Chemistry of Cell contents. The constitution of Proteins, Fats, Lipoids, Carbohydrates and Colloids.

Physiology of Cell membrane.

Reproduction of Cells.

Factors essential to life. Importance of osmotic pressure and soluble bodies, H-ion and OH-ion concentration.

Buffer salts in blood.

Importance of individual inorganic constituents. Importance of temperature. Importance of Oxygen intake and Carbon dioxide. Importance of correct diet. Tissue culture.

Muscular system—general study of muscles, changes in muscles during exercise, chemical changes; fatigue and rigor mortis.

Digestive system—Enzymes, their characteristics and actions. Secretion of salivary glands and action of saliva. Digestion in stomach, small intestine and large intestine.

Functions of pancreas.

Mastication, Deglutition, Peristalsis and Vomiting. Nervous control of the alimentary canal.

Liver and its functions.

Gall-bladder and importance of bile.

The Kidney, broad outlines of its anatomy and histology.

The formation and secretion of urine. Diuretics, Composition of normal and pathological urine.

Skin—Structure and functions of the skin. Regulation of body temperature and fever.

Hormones, Ductless glands—Thyroid, Parathyroid, Thymus, Suprarenal and Pituitary and hormones of ovaries and testes.

The blood—Constituents of blood, nature of the change of blood, quantity of blood flowing in body and function of blood.

Circulatory system—Heart, the course of circulation, Heart beat, Pulse, Arterial blood pressure and its maintenance. Haemorrhage.

Spleen and its functions.

Lymphatic vessels, glands, flow and the relation of lymph and blood.

Respiratory system—Respiration, gaseous exchange in the lung, artificial respiration, effect of respiratory movements on circulation. Asphyxia. Breathlessness or Dyspnoea. Ascent to high altitudes. Mountain sickness and carbon mono-oxide poisoning.

Metabolism—General and basal metabolism. Metabolism of Protein and Carbohydrates, Fats and Carbohydrates.

Central Nervous system—Nervous and Spinal cord. Functions of Cerebrum, Cerebellum, Mid-Brain and Medulla Oblongata, Pain, Heat and Touch sensations, Vestibular and Postural reflex. Effect of Head Rotation, Cerebrospinal fluid, Sleep and intellect.

General outlines of Special Senses.

Nutrition and Dietetics

Elementary ideas on cells and their activities—Catalysis, digestion and assimilation of food in the animal body. Classification of food stuffs, their adulteration and preservation, proteins, fats, carbohydrates and their metabolism, nucleoproteins and the purine bases (Uric acid etc.), Vitamins, Iodine, Inorganic minerals—Calcium, Iron, phosphates and alkalies and their functions in the body nutrition and balanced diets—Malnutrition and deficiency

diseases—Hormones—Growth—Excretion—Respiration—Basal metabolism—some applications of physical chemistry.

Practical Course in Nutrition and Dietetics

Qualitative analysis of typical food stuffs for fat, protein, carbohydrates and mineral salts.

Estimation of moisture, total ash calcium in milk, rice and wheat.

Preparation of ethyl alcohol and acetic acid by fermentation.

Paper II—Bacteriology

Definition of Bacteriology or Microbiology.

Division and differential characterization of Pathogenic Micro-organism.

Morphological study of the bacteria.

Physiology of bacteria.

Bacterial enzymes and bacterial toxins.

General principles of immunity.

Anaphylaxis and Hyper sensitiveness.

The use of microscope in Bacteriology.

Use of cultures in the growth of Bacteria, general principles only.

Filterable viruses, Bacteriophage and Ricketsia.

Practical

1. Outline of the frame work of human body. Classification of bones, structures and composition of bone. General Osteology including bones of the skull, spinal column or vertebral column, thorax upper extremity, pelvis and lower extremity.

2. Study of models and specimens of different organs and parts of the body.

3. The use of Microscope.

4. Histology of a cell, human R.B.C. and W.B.C. Identification of Polymorph nuclear cells, small and large lymphocytes, large Mono, Eosinophills, study of amphibian red blood corpuscle.

Epithelium—Columnar, Squamous, Ciliated and Transitional cells. Areolar and Adiposed tissues Elastic and fibrous tissues, Cartilage and bones Straited and plain muscles, cardiac muscles, Blood vessels and nerves. Lymph glands-spleen and tonsils.

Supra-renal, Thyroid, Parathyriod and Pituitary, Skin and Mammary glands, Treachea and lungs. Teeth, tongue Salivary glands. Stomach. Small and Large intestine, liver and Pancreas, kidney, Ureter, Bladder and generative organs. Spinal chord, Medulla Pons, Cerebellum and Cerebrum.

5. Preparation and staining of blood slides.
6. Differential blood count.
7. Determination of total R. B. C.
8. Determination of total W. B. C.
9. Determination of Haemoglobin percentage.
10. Identification of Malarial parasites, *Filaria bancrofti* and L. D. bodies.
11. Preparation of Puss slides and identification of Bacteria.
12. Preparation of sputum slides staining and identification.

Hygiene

Preventive medicine and Public Health Administration.

Air and ventilation—Composition of air, changes in the atmosphere due to respiration, combustion, smoke, dust and bacteria. Diseases due to the impurities of air. Meaning of ventilation, air required for healthy and sick persons and animals. Combustion. Natural and artificial ventilation and purification of air.

Houses—Sanitation, floors, roofs, walls, doors, windows, kitchens and drains.

Sanitation and cleanliness—Disposal of refuse, conservancy, water carriage system. Disposal of slop water, sewers, sullage. Septic tanks and sewerage.

Water—Composition, quantity of water required for different purposes. Sources of water. Storage. Impurities and purification.

Personal hygiene and effects of exercise on different systems.

Infection—Sources, channels of infection, modes of transmission of infections.

Restraint of infection—Notification, isolation, quarantine and disinfection. Antiseptics and disinfection.

Infection and carriers of infection.

Parasitic diseases caused by *Ancylostome duodenale*, *Ascaris lumbricoidalis*, *Oxyuris vermicularis*, Tape worm, *Dracanculus medinensis*, and *Filaria bancrofti*.

Preventible diseases—Malaria, Kala-Azar, Plague, Enteric fever. Cholera and Dysentery, Diphtheria, Small pox. Chicken pox, Measles, Tuberculosis, Mumps, Cerebrospinal Meningitis, Influenza, Beri-Beri or epidemic dropsy, Leprosy and Rabis.

Anti-natal, Neo-natal and Post-natal care for mother and infant. Prophylaxis of venereal diseases.

Books Prescribed :—Same as for the Home Arts Degree.

Papers III and IV

Chemistry and Bio-Chemistry

Principles of Elementary Chemistry and Bio-chemistry—Law of conservation of matter—Laws of Definite, Multiple and Reciprocal proportions—Gay Lussac's Law—Gas Laws—Elementary ideas on Atomic Theory and determination of Atomic and Molecular weights—Avogadro's hypothesis—Solution—Osmotic pressure—Lowering of freezing point and elevation of boiling point—Law of Mass action—Periodic Law. Elementary ideas of Electrolytic dissociation Theory and Hydrogen ion concentration—Elementary ideas about thermochemistry, Heat of Neutralization—Colloids—Absorption—Elementary ideas about Electro-chemistry and Photo-chemistry.

Preparation, Properties and application of the following elements and their important compounds—Hydrogen, Oxygen, Nitrogen, Carbon, Phosphorus, Fluorine, Chlorine, Bromine, Iodine, Sulphur, Silicon, Boron, Sodium, Potassium, Calcium,

Magnesium, Zinc Mercury, Silver, Iron, Copper, Gold, Arsenic, Lead, and Aluminium.

Preparation, properties and composition of the following compounds :—

Mathane, Ethylene, acetylene, methyl chloride, chloroform, carbon tetrachloride, iodoform, methyl alcohol, ethyl alcohol, ethyl acetate and etacetoacetate, formaldehyde, acetaldehyde, chloral, ether, acetone, formic acid, acetic acid, butyric acid, oxalic acid, glycerol, composition of fats and soaps, lactic acid, citric acid, Tartaric acid, optical activity, carbohydrates, glucose, fructose, sucrose, starch and cellulose Benzene, Benzoic acid, salicylic acid, nitrobenzene, aniline phenol, benzaldehyde, naphthalene.

Practical course in Chemistry and Biochemistry

Identification of N, S, halogens in an organic compound, melting point and boiling point of organic compounds identification of ethyl alcohol, acetone, chloroform, iodoform, tartaric citric, oxalic benzoic, salicylic, carbolic and acetic acids, formaldehyde, glycerine, glucose, canesugar, starch and urea.

Preparation of soap, iodoform, quantitative estimation of Fe, Ca, Mg, SO_4 , PO_3 , NH_4 , and glucose.

Qualitative analysis of an inorganic mixture containing *four* radicals Ag, Hg, Pb, Cu, Bi, Cd, As,

Sb, Sn, Fe, Cr, Al, Zn, Mn, Ni, Co, Ba, Ca, Sr, Mg, Na, K, NH_4 , Cl, Br, I, NO_3 , NO_2 , CO_3 , SO_4 , SO_3 , S, PO_4 .

II Sociology

Paper I—Home Economics.

Household Management and Economy.—

1. Household Management : Underlying principles, health and economy. Housewife's responsibility for daily marketing and purchase of household supplies, distribution and storage ; menu planning, providing for care and cleaning of house, training and management of servants ; care of children. Participation of other members of family in budget making ; provision and planning for improvement. Consideration of adjustments needed as India becomes more industrialised.

2. Economics : Family budgets : sources of income and allotment of expenditure between or among various items balancing the budget-maintenance of necessary standards of various economic levels—the child and money management. Consumption : Human wants, characteristics of wants ; classification. Law of consumption. Law of demand : law of diminishing utility, law of equi-marginal utility, Engel's law of consumption,

relation between spending and saving. Money and credit; money, its functions, different types of money, relation between money and prices credit instruments; cheques, drafts, bills of exchange, promisory notes. Banks: functions, types of banks in India, saving and investments, avenues for investments, stocks and shares.

Paper II—Psychology with special reference to
Child Psychology.

1. Methods and objectives of child study.
2. The Relation of Child Psychology to General Psychology and Educational Psychology.
3. Infancy—its significance and general characteristics.
4. Heredity—its meaning and significance, Mendelism. Environment—its meaning and influence. Home, school and society.
5. Laws of growth—Stages in child life.
6. Instincts—their nature, classification and development. Instinct and Habit; imitation and suggestion. Role of Play in child development. Theories of Play.
7. Senses and sense training.
8. The emotional life and its development. Conditioning and unconditioning of Emotion.

9. The nature and conditions of attention. Interest and Attention.
10. Memory and Imagination. Training in Imagination.
11. Character of Children's Thought. Training in Thinking.
12. Nature of Intelligence. Spearman's Theory. General idea of Binet-Simon Tests.
13. Languages and its development.
14. The conative life and its development. Childhood and Habit formation. Formation of Character.
15. Motor Development, Principles of motor learning.
16. Fatigue and its treatment.
17. Cross-section of the child at different stages.
18. Miscredited tendencies.—Children's lies, introversion, extroversion. rationalisation, obstinacy, truancy, cruelty, daydream, *dementia praecox* hysteria, etc.
19. Precocious and backward children, their education.

Books recommended :—

1. Sandiford : The Mental and Physical Life of School Children.
2. Norsworthy and Whitely : The Psychology of Childhood.
3. J. J. Morgan : Child Psychology.
4. Kirpatrick : Fundamentals of Child Study (New and Revised edition).
5. D. A. Thom : Everyday Problems of the Everyday Child (D. Appelton).

Or

Paper II—Ethics.

A Cultural and Ethical Development.

1. Education : problem and guidance in the experiences of the child from nursery school through college.
2. Appreciation of Indian arts and of arts of other cultures; art in the home, use of pictures, picture books, etc., suitable decoration for the home; principles of costume and design; art appreciation handicrafts.
3. Music in the home; brief survey of the history of music; analysis and illustration of the

various forms of musical compositions ; development of appreciation and understanding of good music, oriental and western ; suitable records of the great master-pieces, relation of music to personality development.

4. Literature in the home ; study of master-pieces concerning the home ; novels, poems, selection of a library for the home ; special study of literature suitable for children, creation of stories for Indian children with suitable illustration.

5. Character training in the Home.

B. Sociological Relationship (Advanced).

1. Problems and characteristics of urban and rural life, adjustments of basic needs to social pressures.

2. Social ethics ideals, obligations, community tensions, social actions.

3. The family's responsibility in the development of the community, especially women and civic responsibilities ; responsibilities of women whether electors or members with relation to functions of local authorities—municipal boards district boards, " panchayats " such as lighting conveyances, education, in " pechayathars " parks, safety, public health, special reference to dispensaries, quarantine, inoculation, cleanliness of streets and markets, pure food,

pure water—education commit court of domestic relations.

• 4. Techniques for social work methods and types of organised effort.

5. The place and responsibility of the Indian community in promotion of successful family life ; old ideals and usable Indian pattern educational agencies—religious organisations—social and recreational agencies—health promotion institutions—occupational opportunities.

6. The nation's responsibility in family development.

7. Family relations as a basic for better world order.

8. Some experience in family and individual case studies experience in nursery school observation, organisation and direction ; school recreation ; village health and social work, with practical application of principles from each course incorporated in definite, correlated projects.

(III)—Household Arts

GROUP A—Two Papers

Paper I—(A) *Principles of Arts and Design.*

A. Introduction to arts.

B. Art appreciation.

C. Application of art principles in the Home.

(a) Design—Structural and Decorative.

(b) Harmony—Proportion and Balance
in :—

1. Furniture and its arrangement.

2. Floor coverings and decoration.

3. Curtains for windows and doors.

4. Accessories :—

(i) Pictures.

(ii) Books.

(iii) Ornaments.

(iv) Lamps.

(v) Flowers.

(c) Colour principles and application :—

1. Wall and floor backgrounds.

2. Furniture Textiles.

3. Curtains.

4. Accessories.

(d) Arrangements of various rooms and
verandahs.

(e) Planning of a home in view of family
requirements.

Practical

1. A colour scheme for a room.
2. Alpana designs for pottery and floors.
3. Flower arrangements.
4. Make :—(a) Removable covers for chairs seats and takhats.
(b) Cushion covers.
(c) Curtains.

Books :—

1. D. B. COCKRELL : Introduction to Art.
2. COLLINS AND RILEY : Art Application.
3. H. GOLD STEIT AND V. GOLDSTEIN : Art of Everyday Life. Revised Edition, Mac-Millan and Co., N. Y.
4. P. J. FRANCHÉL : Space for living creative interior decoration and design. Double Day Doran and Co., N. Y.
5. A. JACKSON : Study of Interior Decoration, Double Day Doran and Co. N. Y.
6. Alpana. Book available at Shantiniketan will be mentioned later on.

7. The Home Lovers Encyclopedia, illustrated (1850 illustrations). A Practical Guide to all Home Craft, London. The Amalgamated Press Ltd., Latest Edition.

(B *Household Furnishings* (as on pp. 12—15, Syllabus for the Course of Home Arts.)

Or

Paper II—(a) Textiles.

1. Method of constructing fabrics
2. Methods of constructing yarn.
3. Finishing, colouring and decorating fabrics.
4. Characteristics of textiles fibres :—
(a) Wool, (b) Silk, (c) Cotton, (d) Linen,
(e) Synthetic fibre.
5. Selecting fabrics for clothing and house-hold use.
6. Care of fabrics.
(a) Laundering and stain removal.
(b) Dry cleaning.
(c) Protecting from mildew and moth.

Practical

- 1 Weave sampler on small loom.
2. Make a collection of samples of all available types of fabrics.

3. Spin samples of wool and cotton yarn.
4. Make a collection of various samples showing progress from new fiber to finished yarn.
5. Dry samples of fabrics.
6. Decorate fabrics with block print, batik, stencils, tie dyed.
7. Make tests to identify various textile fibres.
8. Make field trip to bazar to note points in selecting fabrics for various purposes.
9. Laundering methods.
10. Stain removal.
11. Dry cleaning.
12. Storing cloth.

Books recommended :—

1. K. P. HESS : Textile fibres and their use.
Lippencott, Philladelphia, U. S. A.
2. G. E. DYER : Textile Fabrics.
Houghton Uniffin Co., N. Y.
3. EVENS AND MCGOWAN—A guide to Textiles. John Wiley and Sons, Inc. N. Y.

Or

- (b) Cookery [Same as for Home Arts Degree.]

Or
GROUP B

Music

The same course as for the Home Arts Degree.

Or
GROUP C

Painting

The same course as for the Home Arts Degree.

M.Sc. EXAMINATION

MATHEMATICS

M.A. and M.Sc. Previous Examinations

There will be four papers :—

PAPER I—*Differential Calculus, Integral Calculus
and Differential Equations.*

Differential Calculus :

Rational and irrational numbers, sequences and limits, concept of a function, continuity, differentiability, the mean value theorem, Taylor's theorem, maxima and minima of functions of two or more variables change of variables.

Integral Calculus :

Riemann's definite integral, mean value theorems, improper integrals, definite integrals includ-

ing Beta and Gamma functions. Change of variables and of order of integration, multiple integrals with simple applications, Green's theorem, use of Fourier's series. Uniform convergence and term by term differentiation and integration of series.

Differential Equations :

Relevant solution, linear equations of 2nd order, variation of parameter, homogeneous and exact equations.

Relevant portions from the following books are recommended :—

1. CARSLAW : Fourier Series and Integrals.
2. GOURSAT-HEDRICK : Mathematical Analysis, Vol. I.
3. HARDY : Pure Mathematics.
4. MURRAY : Differential Equations.

PAPER II—*Theory of Equations and Analytical Geometry of two and three dimensions.*

Theory of Equations :

General properties of equations ; relations between roots and co-efficients ; symmetric functions of the roots ; transformations of equations ; algebraic solutions of cubics and biquadratics ; n th roots of unity ; properties of derived equations ; limits

of the roots of equations; approximate solutions of numerical equations; determinants.

Analytical Geometry of two dimensions :

Reduction of general equations of 2nd degree to standard forms, and systems of conics.

Analytical Geometry of three dimensions :

Plane; straight line; properties of conicoids and confocal conicoids referred to principal axes; plane sections; generating lines and reduction of general quadrics to standard forms.

PAPER III—*Statics and Dynamics of a Particle and Rigid Dynamics in two dimensions.*

Statics :

Virtual work; stability; strings in two dimensions; forces in three dimensions and centres of gravity. Attractions and potentials of rods, discs, spheres and circular cylinders.

Dynamics of a Particle in two Dimensions :

Motion in resisting medium, hydograph, central orbits and constrained motion.

Rigid Dynamics in two Dimensions.

Moments of inertia; D'Alembert's principle and motion in two dimensions.

PAPER IV—*Same as Paper VI in B. Sc. (Honours).*

M.A. and M.Sc. Final Examinations

There will be five papers.

PAPER I—*Analysis.*

Contor's theory of irrational numbers, limits, general principle of convergence; linear sets, limiting points and derivatives; descriptive terminology of sets of points; enumerable aggregates; power of an aggregate; notion of content and measure, continuous and discontinuous functions; uniform continuity, differentiability and Riemann's integrability of a function of a real variable.

(The Course is indicated by Hobson's theory of functions of a real variable, Vol. I, 1927) Ss 23—32, 46—55, 57—62, 116—119, 205—214, 217, 220—226, 259—260, 329—333 and 337.

Complex numbers, analytic functions of a complex variable, conformal representation of a plane upon another plane. The general theory of logarithmic, exponential and circular functions. Cauchy's theorem and the theory of residues. Development in power series; Taylor's and Maclaurin's series, and Laurent's series.

Convergence of infinite series including uniform convergence, and convergence of infinite products and infinite integrals.

Books recommended :—

CARSLAW : Fourier Series and Integrals.

HOBSON : Plane Trigonometry.

HARDY : Pure Mathematics.

WHITTAKER AND WATSON : Modern Analysis.

The following books may also be consulted :

BROMWICH : Infinite Series.

HOBSON : Theory of Functions of a Real Variable, Vol. I, Chapters I and II.

GOUSSET-HEDRICK : Mathematical Analysis,
Vol. I and II, Part I.

PAPER II—*Analytical Geometry of two and three dimensions.*

Analytical Geometry of two dimensions :

Homogeneous and tangential co-ordinates ;
systems of conics and their invariants and
co-variants.

Analytical Geometry of three dimensions :

Surfaces in general and curves in space. Geodesic lines, lines of curvature and asymptotic lines.

Books recommended.—

SALMON : Conic Sections.

BELL : Coordinate Geometry of Three Dimensions.

SMITH : Solid Geometry.

ASKWITH : Analytical Geometry of the Conic Sections.

LONEY : Coordinate Geometry, Part II.

GOUSSET-HEDRICK : Mathematical Analysis, Vol. I.

PAPER III—*Differential Equations and Dynamics of a particle and of rigid bodies in three dimensions.*
Differential Equations :

Integration of linear differential equations of the second order in series ; Legendre's, Bessel's, Ricatti's and hypergeometric equations ; total differential equations ; ordinary simultaneous differential equations ; partial differential equations of first and higher order ; solutions of Laplace's and Poisson's equations.

Dynamics of a particle and of rigid bodies in three dimensions : including equations of motion in three dimensions, Lagrange's coordinates, theory of small oscillations and gyroscopes.

Books recommended :—

FORSYTH : Differential Equations.

MURRAY : Introductory Course in Differential Equations.

ROUTH : Dynamics of a Particle and Rigid Bodies, Vol. I.

RAMSAY AND BESANT : *Treatise on Dynamics.*

LAMB : *Higher Mechanics.*

LONEY : *Dynamics of a Particle and Rigid Bodies.*

PAPER IV—*Hydromechanics.*

Hydrostatics :

Laws of fluid pressure, equilibrium of floating bodies, general conditions of equilibrium, stability rotating liquids and equilibrium of gases.

Hydrodynamics :

Kinematics : equations of motion ; sources and sinks ; images ; motion of circular and elliptic cylinders in two dimensions ; motion of a sphere through liquids ; simple waves ; vibration of air in tubes.

Books recommended :—

BESANT AND RAMSAY : *Hydromechanics, Parts I and II.*

PAPER V—*Any one of the following (special knowledge of the subject selected will be required) :*

1. Differential Geometry.
2. Elliptic Functions.

(a) Whittaker and Watson's Modern Analysis (ed. 4) : Chaps. XX, XXI, XXII, (pp. 429—535).

(b) Greenhill's Elliptic Functions (1892) : Chap. III (pp. 66 - 111) and Chap. VII (pp. 210—253).

3. Theory of aggregates and Theory of Functions of a Real Variable.

(a) Theory of points sets, as given in Townsend's Functions of a Real Variable, Chapter II (pp. 44—78).

(b) Pointwise discontinuous functions, functions of bounded variation, and functions of limited total fluctuation, as given in Hobson's Theory of Functions of Real Variable, Vol. I (1927), Chap. V (pp. 316—338).

(c) Functions of two variables, double and repeated limits, ordinary and higher partial differential coefficient, as given in Hobson's Theory of Functions of a Real Variable, Vol. I (1927), (pp. 404—429 excluding Ss. 307—308).

(d) The Lebesgue integral and connected topics, as given in Titchmarsh's

Theory of Functions, Chaps. X, XI, XII (pp. 323—398).

(e) Fourier series, as given in Titchmarsh's Theory of Functions, Chap. XIII (pp. 399—444).

(f) The Allied series of a Fourier series, as given in Hobson's Theory of Function of a Real Variable, Vol. II, 1926 (pp. 692—698).

4. Theory of Functions of a Complex Variable.

The Theory of Functions by Titchmarsh (pp. 107—187 and 198—317), and Dirichlet's series by G. H. Hardy and M. Riesz (pp. 1—26).

5. Theory of Numbers.
6. Theory of Probabilities.
7. Vector Analysis.
8. Projective and Non-Euclidean Geometry.
9. Harmonic Analysis.
10. Differential Equations.
11. Integral Equations.
12. Hydrodynamics.

The use of Conformal Representation ; Discontinuous Motion. Free Stream Lines ; Aerofoils ; Irrotational Motion in three dimensions (omitting motion of a sphere). Motion of a solid through a liquid ; Vortex Motion ; Viscosity ; as given in Ramsay's Hydrodynamics, fourth edition pp. 127—158, 164—254, 363—409. Tidal Waves as given in Lamb's Hydrodynamics, sixth edition, pp. 250—290.

13. Elasticity.

14. Electricity and Magnetism.

Induction currents in continuous media ; Displacement currents and Electro-magnetic Waves ; the Electromagnetic Theory of Light ; the motion of electrons, as given in the Mathematical Theory of Electricity and Magnetism by J. H. Jeans (Chaps. XV, XVII, XVIII, XIX, pp. 470—483 and pp 510—592.)

Relativistic Mechanics ; Electrodynamics of moving bodies ; the Mechanics of simple atomic models ; the New Quantum Mechanics ; Atomic problems first solved by the Wave Mechanics ; Nuclear Physics ; as given in Theoretical Physics by George Joos (Chaps. X, XXVI, XXXVIII, XL, XLI, pp. 216—248 ; 443—455 ; 603—698).

15. General Astronomy and Combination of Observations.

- (a) Expansions in elliptic motion, relation between two or more positions in an orbit and the time, the orbit in space, conditions for the determination of an elliptic orbit, determination of an orbit, the method of Gauss as given in *An Introductory Treatise on Dynamical Astronomy* by H. C. Plumer (Chapters IV, V, VI, VII, VIII, pp. 33—93).
- (b) Precession and nutation, and the aberration of light as given in a *Treatise on Spherical Astronomy* by R. S. Ball, Chapter VII. (pp. 171—200), Chapter XI. (pp. 248—276).
- (c) The method of least squares as given in *Chauvenet's Spherical and Practical Astronomy*, Volume II, Appendix (pp. 469—566).

[Whittaker and Robinson's *Combination of Observations*, Chapters VIII and IX, and Brunt's *Combination of Observations*. Chapters I to IX, may be consulted.]

16. Celestial Mechanics.

17. Geometrical and Physical Optics.
18. Theory of Relativity.
19. Sound and Vibrations.
20. Advanced Dynamics.
21. Figure of Earth.
22. Substitution groups with application to the Theory of Equations.

PHYSICS

M.Sc. Previous Examination, 1950

The candidates for the M. Sc. Previous Examination in Physics will be examined in the following four written papers, each of three hour's duration:

Paper I—Properties of Matter and Sound.

Paper II—Heat.

Paper III—Light.

Paper IV—Electricity and Magnetism and Electron theory.

and in a Practical Examination of two days' duration, each of six hours. Each of the four written papers will carry 100 marks, and the Practical Examination 200 marks, so as to make an aggregate of 600 marks.

Syllabus

I.—General Physics and Sound :

Theory of elasticity and its application to bending of bars, torsion of cylinders, extension of helical springs, and vibrations of plates. Hertz's theory of impact. Gyroscopes. Capillarity ; surface tension phenomena ; waves and ripples ; thin films. Viscosities of liquids and gases. Steady and turbulent flow.

Libratory systems of one and two degrees of freedom ; vibrations of strings, air columns and resonators ; forced vibrations and their maintenance. Acoustical measurements and measuring instruments. Sources of sound. Measurement of acoustic impedance and of sound output. Architectural acoustics. Elements of ultrasonics.

II—Heat.

Kinetic theory of gases ; mean free path ; transport phenomena. Brownian motion. Phenomena in gases at low pressures. Equations of state. Theory of conduction of heat. Periodic flow of heat. Thermodynamic formulæ and their applications. Thermodynamic functions. Heat engines. Equilibria of systems. Laws of radiation. Planck's theory and its experimental verification. Radiation from the sun ; temperature of the photosphere of the

sun. Quantum theory of specific heats of gases and of solids. Nernst's Heat. Theorem. Absolute value of entropy and the chemical constant.

III.—Light.

Thick lenses and systems of lenses. Defects of images and their rectification. The Principle of Huygens. Interference and diffraction phenomena and their applications. Diffraction gratings ; interference spectrometers. Theory of optical instruments. Abbe's theory of microscopic vision. Meteorological optics. Molecular scattering of light ; Raman effect.

Propagation of light in uniaxial and biaxial crystals ; internal and external conical refractions. Elements of the electromagnetic theory of light ; application to reflection and refraction at the surfaces of transparent media, total reflection and metallic reflection. Theory of dispersion.

Emission and absorption spectra of the hydrogen and the alkali atoms ; explanation on the Bohr-Sommerfeld theory, Spectroscopy in the infra-red and in the ultraviolet regions. Fluorescence ; resonance radiation. Optical rotation. Electro-optic and magneto-optic phenomena.

IV.—Electricity and Magnetism and Electron Theory :

Production and measurement of high electric and magnetic fields. Method of electrical images and its simple applications Measurement of charges : potentials, resistances, capacities and self and mutual inductances. Ratio of the electrostatic to the electromagnetic unit of charge. Generators, motors, transformers, etc. Theory of alternating currents A. C. measuring instruments.

Magnetic properties of substances. Elementary ideas of the behaviour of dia-, para-, and ferromagnetics. The magnetism of the earth.

Production and study of the properties of electro-magnetic waves ; simple wireless transmitting and receiving sets.

Measurement of the charge and the mass of the electron ; positive ray analysis ; mass spectrographs Emission of electrons from hot bodies ; Richardson's equation. Photo-electricity. Elements of radioactivity. α -ray scattering ; nuclear charges. The Rutherford-Bohr model of the atom. The production and properties of X-rays ; Moseley's law. X-ray scattering ; Compton effect.

List of Experiments

1. Experiments on gyroscopes.

2. Young's modulus of the material of a glass plate.
3. Viscosities of liquids and gases.
4. Surface tension of a liquid by the ripple method.
5. Measurement of acoustic impedances.
6. Absorption coefficient of typical materials for sound waves.
7. Verification of the laws of Brownian motion.
8. Specific heat of carbon at different temperatures.
9. Thermocouple ; platinum resistance thermometer.
10. Thermal conductivity of rubber and ebonite.
11. Thermal conductivity of gases at low pressures.
12. Determination of Stefan's constant.
13. Determination of the wavelengths of :
 - (a) Fraunhofer lines in sunlight.
 - (b) Balmer lines of hydrogen.

14. Calibration of a prism spectrograph with Edser Bulter fringes.

15. Fine structure of the green line of the mercury are with a Fabry-Perot interferometer.

16. Normal Zeeman effect with a Lummer-Gehrcke plate.

17. Michelson's interferometer :

- (a) visibility curve for the D-lines of sodium,
- (b) determination of the refractive index of air.

18. Rayleigh's interferometer : dispersion of refractive index of mica.

19. Determination of the depolarization of light scattered by liquids.

20. Babinet's compensator: optical constants of metals.

21. Temperature coefficient of resistance of manganin with a Carey Foster's Bridge.

22. Measurement of self-inductance by A. C. and D. C. methods.

23. Magnetic susceptibilities of

- (a) solids.
- (b) liquids and solutions.

24. Hysteresis curves

(a) by ballistic method.

(b) by the oscillograph method.

25. Dielectric constant of a liquid by the heterodyne beat method.

26. Characteristic curves of thermionic valves with an oscillograph.

27. Verification of the laws of oscillations with thermionic valves.

23. Determination of

(a) the charge of an electron by Millikan's method, and

(b) the specific charge with a thermionic valve.

29. Verification of Richardson's equation.

30. Frequency of an oscillator with Robinson bridge.

31. The capacity and power factor of a condenser with a Schering bridge.

PHYSICS**M. Sc. Final Examination 1948**

The candidates for the M. Sc. Final Examination Physics will be examined in four written papers, each

of three hours' duration, and a Practical Examination of two parts, each of six hours' duration. The first three written papers will be on 'Modern Physics' and the fourth will be on a Special Subject to be chosen by the candidates from among the following :—

1. Spectroscopy.
2. X-rays.
3. Wireless.
4. Magnetism.
5. Light Scattering.
6. Low Temperature Physics.
7. Advanced Acoustics.

The Practical examination will consist of two parts, Part I in Modern Physics and Part II in the Special subject chosen by the candidate for Paper IV of the written examination. Each of the four written papers and each part of the Practical examination will carry 100 marks, so as to make an aggregate of 600 marks.

SYLLABUS

PAPER I

Modern Physics

The Bhor-Sommerfeld theory of the atom. Election Spin. Fine structure of the hydrogen lines.

Correspondence principle. Optical spectra of the alkalis. Vector model of the atom; Different types of coupling. The four quantum numbers. The spectrum of helium. Resonance phenomenon. Critical potentials of atoms.

General features of the X-ray absorption and emission spectra of atoms. The spin and the screening doublets. Atomic structure and Periodic Table.

Rotational, rotational-vibrational and electronic spectra of diatomic molecules. Franck-Condon principle.

Lorentz theory of the electron. Radiation from dipoles and multipoles. Radiation damping Dielectric polarization; permanent dipole moment and its measurement. Dielectric behaviour and the Curie temperature of Rochelle salt. Energy loss in dielectrics. Electrolytes. Theory of Debye and Onsager.

Dispersion, absorption and scattering of light and of X-rays. Compton and Raman effects. Fluorescence. Resonance radiation. Brillouin scattering in light scattering. Ultrasonic waves. Diffraction of light by ultrasonic waves. Diffraction of X-rays and of electron waves; applications to the study of molecular and crystalline structures. The electron microscope.

PAPEE II

Modern Physics

The Larmor precession of atoms in a magnetic field. Diamagnetism; Langevins's theory; Van Leeuwen's theorem. Paramagnetism; atomic and Molecular magnetic moments; temperature variation of paramagnetism; oxygen, nitric oxide, salts of the rare earth and the iron groups, and complex salts; influence of internal electric fields. Weak paramagnetism. Gyromagnetic effects. Adiabatic demagnetization. Production and measurement of extremely low temperatures. Paramagnetic relaxation. Ferromagnetism: Weis's theory. Internal fields in ferromagnetics. Thermo-magnetic, galvanomagnetic and magnetooptic phenomena. Study of magnetic properties in high magnetic fields.

The classical statistics of Boltzmann; entropy and probability; phase space; Liouville's theorem. The Maxwell-Boltzmann energy distribution. Law of equipartition. Theory of fluctuations.

Quantum condition for the sub-division of phase space into cells. Bose-Einstein statistics; Planck's law. Einstein condensation; Helium II as an example.

Fermi-Dirac statistics. Thermal properties of an electron gas. Electronic structure of metals, Brillouin zones in crystals, Metals, semi-conductors and insulators. Photo-conductivity. Alloys. Order-disorder phenomena. Supra-conductivity.

Relativity :

Optical phenomena associated with motion through aether ; aberration of light Airy's water telescope Fresnel-Fizeau aether drag, the Michelson Morley experiment. Electrodynamics of moving bodies ; the experiments of Rowland, of Trouton and Noble, and others. The fundamental postulates of the Special Theory of Relativity ; Lorentz-Einstein Transformation ; Fitzgerald-Larmor contraction : Einstein time dilatation ; addition of velocities. Minkowski's four dimensional World ; World-vectors. Generalized expression for Newton's Second Law of Motion ; variation of mass with velocity ; the inertia of energy. Relativistic-invariant form of the electromagnetic equations. Elements of the General Theory of Relativity.

PAPER III

Modern Physics

Wave Mechanics :

Hamilton's Principle of Least Action. Hamilton-Jacobi Equation. Matter waves ; de Broglie

wavelength. Dual nature of light and matter. Theory of Observables; Principles of Uncertainty and Complementarity. Schroedinger's equation; application to linear oscillator and rotator. Degeneracy in quantum mechanics. The Kepler problem; the wave mechanics of the hydrogen atom. Theory of perturbations and its simple applications. Zeeman effect of the hydrogen atom; Heitler-London model of the hydrogen molecule. Theory of dispersion; negative dispersion terms. The helium problem; resonance. Transition probabilities Selection rules.

Elementary treatment of systems of identical particles. Symmetric and antisymmetric states. Elementary ideas of Dirac's theory of radiation.

Elements of Dirac's theory of the electron; spin of the electron; negative energy states; creation of electron pairs.

Nuclear Physics:

Methods for the determination of the charge, mass, spin and magnetic moment and the statistics of atomic nuclei. Radioactive disintegration; spectra of radio-spectra of radiations from radioactive elements; α ; β and γ -rays; Geiger-Nuttall and Sargent relations; nuclear energy levels. Production of high energy charged particles. Wilson's Cloud

Chamber, Geiger Counter, etc. Scattering of α rays, protons, deuterons, and neutrons (including slow neutrons), and of γ -rays. Inelastic scattering; artificial disintegration; potential barrier of the nucleus; resonance capture; determination of cross sections. Fission of heavy nuclei. Induced radioactivity. Nuclear reactions and their applications. Theory of the structure of the nucleus as built up of protons and neutrons; nuclear stability; interactions between the heavy particles in the nucleus. Nuclear isomerism.

The magnetic moments of the proton and the neutron.

β -ray decay and the neutrino.

Cosmic Rays :

Latitude effect; east-west asymmetry: nature of the primary cosmic radiations. Collision loss and radiation loss of energy of fast moving charged particles in material media, their variation with the energy and the mass of the particles. Theory of formation of cascade showers. Rossi transition curves. The penetrating radiations. The meson and its properties.

Practical Course in Modern Physics

LIST OF EXPERIMENTS

1. Anomalous dispersion of the alkali vapours.
2. Spectroscopic identification of metallic elements.
3. Raman spectra of
 - (a) liquids
 - (b) crystals.
4. Diffraction of light by stationary ultrasonic waves in liquids.
5. K-absorption edges of Br and Ag.
6. The wave lengths of the K-emission lines of Cu and Mo.
7. The Laue and the Debye-Scherrer patterns for a cubic crystal.
8. Bragg's ionization spectrometer and the use of the Geiger-Muller counter.
9. Measurements of the principal magnetic susceptibilities of crystals
 - (a) diamagnetic.
 - (b) paramagnetic.
10. Magnetic double-refraction of benzene.
11. Hall effect of bismuth.

12. Determination of Planck's constant with the photo-electric cell.

13. Rate of radioactive decay.

14. Range of α —particles

15. Diffraction of electron waves

16. Dielectric constant of a vapour at different temperatures ; determination of the permanent electric dipole moments of molecules.

Optional Papers

WIRELESS

Network theorems ; T and ∞ networks. Series parallel and multiple resonances ; sharpness of resonance. The infinite line Wave motion on lines with and without dissipation ; line with distributed constants ; reflection on lines. General equations for transmission of waves on lines. Theory of simple electric filters of the constant K type, and of attenuators. Simple coupled circuits and impedance transformation.

Properties of coils and condensers. Resistances of coils at radio frequencies ; skin effect ; properties of iron core coils : their A.C. inductances, when D.C. is superimposed ; incremental permeability. γ Electrolytic and other types of condensers.

Physics of the thermionic tubes ; various types of tubes, their constants and uses.

Audio frequency amplifiers.—resistance coupled, transformer and impedance coupled amplifiers ; classes A and B and push pull amplifiers ; direct-coupled and feed-back amplifiers. Input impedance of a triode.

Radio frequency oscillators and amplifiers; Untuned and tuned amplifiers for reception neutralization circuits and their adjustments.

Power amplifiers :—Classes A, B and C. Crystal oscillators and other frequency stabilization devices ; ultra high frequency oscillators—the magnetron and the Barkhausen-Kurtz types.

Modulation :—Methods of modulation ; simple amplitude and simple-frequency modulations.

Vacuum tube detectors :—Plate, grid, power, heterodyne, regenerative, and super-regenerative detectors. Vacuum Tube voltmeters.

Radio reception. Modern superhet receiver and its performance Automatic volume control and tone control. Simple theory of loud speakers.

Simple television ; receiving and transmitting systems.

Antenna systems and propagation of radio waves :—Current and voltage distribution in on antenna. Theory of radiation Distribution of field around a vertical aneenna. Directional antennas, loop antenna and radio direction finders. Antenna arrays. Theory of the jonosphere: skip distance : echoes and fading.

Practical Course in Wireless

LIST OF EXPERIMENTS

1. Resistance measurement of radio frequency circuits.
2. Determination of the characteristics of a multistage audio-frequency amplifier.
3. Study of a vacuum tube detector.
4. Current voltage relationship in a rectifier filter system.
5. Determination of the performance of a receiver.
6. Measurement of antenna characteristics.
7. Measurement of field strength.
8. Measurement of radio frequencies.
9. Measurement of audio frequencies.

10. Determination of the constants of an audio frequency transformer.
11. Measurement of Q of an inductance.
12. Study of a radio-transmitter.
13. Production and study of ultra-high frequencies.

X-Rays

In addition to a more extensive knowledge of the portion on X-rays included in the syllabus for Paper I, the following :—

X-ray scattering by atoms and by simple molecules in relation to their structures ; structure factor ; distribution of electron density. X-ray scattering by gases, liquids and glasses. Compton scattering ; scattering of α -rays ; Klein-Nishina formula. Photo-electrons and their spatial distribution in space

X-ray absorption and emission spectra ; influence of chemical binding, and of the electronic energy levels in crystals. X-rays spectra in relation to the extranuclear structure of the atoms ; comparison with optical spectra.

The external symmetry of crystals ; the crystallographic systems. Internal symmetry ; space

groups. X-ray methods of crystal structure analysis. (Laue, Debye-Sherrer, rotation-oscillation and Weissenberg methods). Measurement of absolute intensities in X-ray reflection. Application of Fourier methods for mapping electron densities in crystals

Electron diffraction methods and their application to the study of the structures of thin films. Effect of thermal agitation on X-ray reflection. Structures of typical inorganic and organic crystals, and of metals and alloys. Superlattices. Order-disorder phenomena in alloys.

Practical Course in X-Rays

LIST OF EXPERIMENTS

1. Refraction and reflexion of X-rays.
2. Absorption coefficient of X-rays.
3. Change in the hardness of X-rays on scattering.
4. Verification of Moseley's law.
5. Short wave-length limit of the continuous spectrum from an X-ray tube.
6. Absorption edges.

7. Goniometric measurements on typical crystals and the calculation of the axial angles and ratios.

8. Rotation photograph of a cubic crystals and the analysis of its structure.

9. Diffuse X-ray reflections accompanying the Laue spots.

10. X-ray diffraction with a bent crystal.

11. The study of soft X-ray with a vacuum grating spectrograph.

12. X-ray diffraction by liquids.

LIGHT SCATTERING

Tyndall scattering : theories of Mie and Gans. Scattering of light by small colloidal particles reciprocity relationship.

Rayleigh scattering by a gas whose molecules are optically anisotropic : depolarization : attenuation coefficient. The scattering of sunlight by the molecules of the atmosphere ; its intensity, polarization and colour.

Density fluctuations and light scattering : Scattering by dense media ; Smoluchowski-Einstein theory ; critical opalescence. Density scattering and orientation scattering. Scattering by binary

liquid mixtures ; concentration scattering, particularly in the neighbourhood of the critical solution temperature. Rayleigh scattering in solids and glasses. Fine structure of the Rayleigh lines ; Brillouin components.

The optical anisotropies of molecules in relation to their structures. Optical anisotropies of simple crystals. Kerr effect, Cotton-Mouton effect, Maxwell effect and allied phenomena.

Raman effect : its discovery : methods of experimental study in gases, liquids and solids ; general theory of the phenomenon ; the Stokes and the anti-Stokes lines. Theories of Mannebach and Placek for the intensities and the polarizations of the Raman lines ; application to simple diatomic and triatomic molecules ; H_2 , N_2 , O_2 , HCl , N_2O , CO_2 , CS_2 , etc. The Raman and the infra red spectra ; selection rules.

Raman effect in crystals. Raman spectra in relation to the symmetry of the oscillators : Raman effect and chemical constitution.

Practical Course in Light Scattering

LIST OF EXPERIMENTS

1. The depolarization of the light scattered by colloidal particles observed

(a) perpendicular to,

(b) along.

2. The depolarization of the light scattered by the incident electric vector

(a) gases

(b) liquids

(c) glasses.

3. The fine structure of the Rayleigh lines (Brillouin splitting) with a Fabry Perot interferometer.

4. Light scattering by the free surface of

(a) mercury

(b) transparent liquid.

5. Polarization of the Raman lines of benzene and carbon tetrachloride.

6. Raman spectrum of hydrogen and nitrogen gases.

7. Determination of the velocities of ultrasonic waves in liquids.

8. Raman spectrum of sodium nitrate crystal.

9. Elastic constants of a crystal from light scattering.

Magnetism

Theory—A more detailed treatment of the topics in Magnetism given in the syllabus for paper II Modern Physics (para. 1).

Practical.

1. Measurement of suscepibility of.
 - (*o*) diamagnetic gas.
 - (*b*) paramagnetic gas.
 - (*c*) a liquid.
2. Determination of the principal susceptibilities of
 - (*a*) paramagnetic.
 - (*b*) diamagnetic.single crystals.
3. Study of hypothesis of ferromagnetic substances with the cathode-ray oscillograph.
4. Specific Heat of nickel in the neighbourhood of its Curie temperature.
5. Verdet Constant.
6. Hall effect in Bismuth.
7. Magneto Optics. Kerr effect.
8. Magnetic double refraction of benzene.

9. Zeeman and inverse Zeeman effects
10. Gyromagnetic ratios.

SPECTROSCOPY

In addition to a more detailed study of the portions on spectroscopy included in the syllabus for Paper I, the following :

Various methods of producing emission and absorption spectra. Prism spectrographs of different types. Theory of concave grating and different methods of mounting it. Interference spectroscopes of high resolution. Spectroscopy of the infra-red and ultra-violet regions. Spectrophotometry. Quantitative chemical analysis by spectroscopic methods.

Spectra of atoms with one and two valence electrons. The multiplicity of spectral lines. Penetrating orbits, quantum defects, polarisation of the atomic core. Complex spectra. Zeeman effect and Paschen-Back effect. Stark effect of hydrogen atom. Isoelectronic sequences. Nuclear spin, Hyperfine structure, effect of magnetic fields on it. Isotopic effect. Term perturbations and autoionization. Colours of inorganic salts.

Transition probabilities ; Einetein's A and B coefficients ; mean life in the excited states ; metastable

states. Collisions of the first and second kinds. Breadth of spectral lines Thermal ionization and its applications.

Rotational, vibrational-rotational, and electronic spectra of diatomic and linear triatomic molecules, Isotopic effect in molecular spectra ; alternation of intensities. Application of Franck-Condon principle ; Predissociation ; Heat of dissociation. Elements of the theory of Chemical valence. Fluorescence and phosphorescence

Application of spectroscopy to different branches of Physics and Chemistry.

PRACTICAL COURSE IN SPECTROSCOPY

LIST OF EXPERIMENTS

1. Use of Glass spectrographs.
2. Use of quartz spectrographs.
3. Wave length determinations and identification of metallic elements using grating spectrographs.
4. Absorption spectra of alkali vapours.
5. Study of Absorption Bands of I_2
6. Study of emission bands of CN and S_2 .
7. Raman spectra of liquids.

8. The Zeeman splitting of the D-lines of sodium

ADVANCED ACOUSTICS

Introduction; vibrations of strings; normal equations of motion and their solution; plucked, struck and bowed strings; pianoforte and violin strings; motion of the end supports; strings of non-uniform mass and tension; string galvanometer

Vibration of bars. Normal equation of motion and its solution; bar clamped at one end; tuning forks; clamped-clamped and free-free bars; vibrations of a stiff string, vibrations of a ring

Vibrations of membranes and plates; normal equations of motions; rectangular membranes; circular membrane; the condenser microphone coupling the membrane to a resonator-drum; vibrations of plates and bells

Propagation of sound in tubes; closed tube, open tube; Helmholtz resonator; tube with side opening acoustic filters; effect of viscosity and heat conduction.

Propagation of sound in horns. Approximate wave equation; the conical horn; exponential horn.

Radiation, diffraction and scattering of sound waves. General equation of sound waves—its solution;

radiations from cylinders, spheres; simple source, double source; radiation from a piston in a plane wall; scattering of sound; loud speakers and microphones; transmission of sound through apertures.

Dissipation and absorption of sound.

Analogy of electrical, mechanical and acoustical elements and systems.

Theory of electrical networks and filters; design of acoustic filters; electrical attenuators

Audio-frequency electrical apparatus. Design of faithful amplifiers; oscillographs

Electro-acoustical instrument. Microphone, telephone receivers and loud-speakers; theory and design of various types; calibration and testing.

Recording and reproduction of sound; recording on and reproduction from disc and film.

Architectural acoustics; reverberation and its measurements; design of auditoriums.

Electro-acoustical measurements; measurement of intensity, and frequency; production and measurement of ultrasonic waves; noise—its measurement and suppression; analysis and filtration of sound.

PRACTICAL COURSE IN ADVANCED ACCOUSTIC

LIST OF EXPEREMENTS

1. Photography of plucked bowed strings and their analysis.
2. Vibrations of bars and plates, their examination, by forced vibrations due to electromagnet.
3. Helmholtz resonator—measurement of its impedance and amplifying factor.
4. Determination of sound absorption coefficient.
5. Determination of acoustical impedance.
6. Determination of acoustical output of a loud-speaker and its efficiency.
7. Calibration and testing of a loud-speaker.
8. Study of acoustical filter.
 - (a) Cut off frequency.
 - (b) Matching impedance.
9. Microphone-Frequency response D. B. Gain.
10. Measurement of intensity of sound.
11. Ultrasonics.
12. Sound recording and reproduction.

13. Determination of reverberation time.
14. Characteristic and room characteristic of an amplifier.

CHEMISTRY

Previous Examination

Candidates for the M.Sc. Previous Examination will be required to pass in the Written as well as in the Practical Examination separately.

Marks will be allotted as follows :—

	Paper	Practical
Inorganic	100	75
Organic	100	40
Physical	100	35
Record of Practical work		50
		— —
	Total	200

In each paper question will be set in History.

Inorganic.— The elements specified for the B. Sc. Course in more detail including their modes of occurrence and chief metallurgical processes. A general knowledge of the less common inorganic compounds and important rare elements. Allotropy and intermetallic compounds.

Practical Inorganic Chemistry—Mixtures for qualitative analysis may contain silicate, thiosulphate and arsenate in addition to the radicles prescribed for the B. Sc. Pass Course in Chemistry.

Gravimetric estimation of magnesium, calcium, phosphate, carbonate, oxalate, nitrate by Lunge's nitrometer, manganese, nickel, ammonia by indirect method, analysis of silver, nickel, and brass coins dolomite and calcspar.

Volumetric determination involving iodometry, e.g., copper salt, manganese dioxide and arsenious acid.

Titration involving the use of chlorides and thiocyanates and silver nitrate.

Preparation of—

1. Carbonato-tetramino-cobalt nitrate.
2. Anhydrous magnesium chloride.
3. Sodium cobaltinitrite.
4. Sodium phosphates.
5. Sodium tetrathionate.
6. Cuprous chloride.
7. Potassium perchlorate.

Organic.—General knowledge of aliphatic saturated and unsaturated hydrocarbons with their important derivatives such as mono and polyhydric alcohols, mono and poly-aldehydes and ketones with their ordinary and mixed derivatives. Mono and poly-carboxylic acids and their derivatives. Mono and poly-amides and amines, cyanogen compounds, and organometallic compounds.

A general knowledge of aromatic hydrocarbons with their important derivatives such as mono and poly-hydric phenols, alcohols, aldehydes and ketones with their derivatives including monosaccharides. Mono and poly-carboxylic acids, nitro and amino compounds, sulphonic acids, amides and substituted hydrazines. Azo and diazo compounds. Monocyclic terpenes. Pyronine, triphenyl-methane, indigo and alizarin group of dyestuffs. A fuller treatment of the five membered heterocyclic compounds containing only one hetero atom with their derivatives. A fuller treatment of the alkaloids of pyridine group only. A general knowledge of amino acids and proteins and polymethylenes, Stereochemistry of carbon, nitrogen, tin, silicon, and sulphur and of organic co-ordination compounds. Geometrical isomerism, configuration of oximes, molecular dissymmetry and Walden inversion, asymmetric synthesis, tautomerism and condensation.

Practical Organic Chemistry.—Detection of pure organic compound containing carbon, hydrogen and oxygen. Determination of hydroxy groups and estimation of molecular weight of simple organic acids and bases. Class work should also include the quantitative estimation of C, H, N, S, and halogens; and determination of methoxy, ethoxy and carboxy groups.

Attention should also be paid to the following processes.—Esterification, acetylation, nitration, subphonation, hydrolysis, reduction and oxidation. Purification of organic compounds, distillation under reduced pressure, steam distillation and uses of filter pump and Buchner's funnel.

The following organic compounds should also be prepared—ethyl bromide, ethyl or methyloxalate, methyl salicylate or ethyl benzoate, oxalic acid, allyl alcohol, oleic acid, urea, glucosazone, nitrobenzene, aniline, sulphanilic acid, benzene sulphonic acid, methyl orange, Orange II, aminoazobenzene, benzen-azophenol, chloro or iodobenzene, benzyl chloride, acetanilide, tribromaniline benzoic acid, phthallic acid, fluorescein, eosin and quinoline.

Physical.—In addition to what is given in the B. Sc. Course the following should be studied:—

Specific heat at constant pressure and constant

volume, behaviour and equations of gases, dissociation and abnormal vapour densities, general properties of liquids, boiling point, vapour pressure, viscosity and surface tension of liquids, behaviour of mixed liquids, miscible and non-miscible, fractional distillation under reduced pressure, partition coefficient, general properties of solutions connected with osmotic pressure, ionic velocity, transport number, degree of dissociation, properties of electrolytes containing a common ion, theory of indicators, solubility product, simple concentration cells, law, order of a chemical reaction, phase rule, catalysis, colloids, photochemistry, physical properties and chemical constitution, and elementary ideas about radioactivity, isotopes and structure of atoms, valency.

Practical Physical Chemistry—Determination of molecular weight by Victor Meyer's method and by boiling and freezing point methods, density and surface tension of liquids, determination of solubility, determination of partition co-efficient use of spectroscope and polarimeter, electric conductivity.

Historical development of Chemical theories and short account of the contributions of the following chemists—Boyle, Scheele, Priestley, Cavendish, Lavoisier, Dalton, Davy, Berzeliues, Faraday, Liebig, Pasteur, Berthelot, Cannizzaro, Meodeleef, Bunsen

Dumas, Graham, Ramsay, Curie, Moissan, Baeyer, Emil Fischer, Perkin (Senior and Junior), Hoffmann Roscoe, Ostwald, van't Hoff and Arrhenius.

Books recommended :—

1. Partigton : A Text-Book of Inorganic Chemistry.
2. Hopkins : Chemistry of the Rarer Elements.
3. Stewart : Recent Advances in Physical and Inorganic Chemistry.
4. Stewart : Same Physico-Chemical Themes.
5. Clowes and Colemann : Quantitative Chemical Analysis.
6. Mollwo Perkin : Qualitative Chemical Analysis.
7. Findlay : Practical Physical Chemistry.
8. Lewis : A System of Physical Chemistry, Vols. I and II.
9. Taylor : A Treatise on Physical Chemistry, Vols. I and II.
10. Bernthsen and Sudborough : A Text-Book of Organic Chemistry.
11. Cohen : Practical Organic Chemistry.
12. Clarke : Identification of Organic Substances.

13. Thorpe and Whiteley : Manual of Organic Chemical Analysis.

(All latest editions.)

Final Examination

Candidates for the M.Sc. Examination will be required to pass in the Written as well as in the Practical Examination separately.

Students who have passed the Previous and B.Sc. Honours in Chemistry may present any one of the following branches of Chemistry :

- (1) Inorganic, (2) Organic, (3) Physical, (4) Applied and (5) Agricultural.

Notice must be sent to the Registrar by the 15th August of the branch which the student intends to present at the ensuing examination and in the case of (4) the industry or manufacture to which he is attached.

A student may present a thesis dealing with original work done by him in his selected branch in place of a part of practical examination ; he will be liable to any enquiry or examination in the subject matter of his thesis which the examiners may see fit to impose.

Marks will be allotted in each branch as follows:—

First Paper	..	100	Marks	
Second Paper	..	100	„	
Practical Work	..	200	„	{ Thesis .. 100
				{ Practical 100
Total	..	400	„	

THEORETICAL

1. *Inorganic*—Candidates are expected to possess a more advanced knowledge of the subject than in the Previous M. Sc. Course and should be acquainted with the recent work on that subject.

2. *Organic*—Candidates are expected to possess a more advanced knowledge of the subjects than in the Previous M. Sc. Course and should be acquainted with the recent work on that subject.

3. *Physical*—Candidates are expected to possess a more advanced knowledge of the subjects than in the Previous M. Sc. Course and should be acquainted with the recent work on that subject.

4. *Applied*—The principle has been laid down that a candidate will be expected to show that he has *bona fide* devoted himself to some important industry

or manufacture and has acquired a reasonable degree of efficiency under all three of the following heads :—

- (i) *Technical*—He should have either (a) performed systematical analytical control or (b) engaged in systematic research or (c) introduced improved methods of mechanical handling, application or distribution of power; etc.
- (ii) *Economic*—He should have acquired some knowledge of sources and markets of casting (including) plant, power, labour, control, distribution depreciation, etc., and of disposal or utilisation of by-products and waste.
- (iii) *Foreign*—He should have studied the methods in use in other countries as far as ascertainable by him.

The procedure for testing the fitness of a candidate will be decided as occasion arises.

5. *Agricultural*—Candidates are expected to possess a more advanced knowledge of the subjects than in the Previous M. Sc. Course and should be acquainted with the recent work on that subject.

PRACTICAL

A candidate offering thesis in any of the branches will have to appear in a practical examination carrying 100 mark. The record of practical work in their case will not carry any marks.

The candidate offering no thesis will appear in a practical examination carrying 150 marks and the record of their work during the year will carry 50 marks.

The questions in compulsory practical examination in Physical and Organic Chemistry will be set from the following experiments done by the candidate during the course of the year in the respective branches : —

Physical Chemistry.

Practical—Part I (Compulsory).

A. *Electrical conductivity of solutions.*

- (1) Determination of hydrolysis constant.
- (2) Determination of ionisation constant for water.
- (3) Determination of dissociation constants of weak acids and bases.
- (4) Determination of solubilities of sparingly soluble salts.

(5) Determination of basicity of acids.

(6) Conductivity titration.

B. *E. M. F. Measurements.*

(1) Preparation of buffer solutions and measurement of Ph. values.

(2) Determination of first, second, third-dissociation constants of polybasic acids.

(3) Valency of ions.

(4) Composition of complexions.

(5) Solubility products of sparingly soluble salts.

(6) Oxidation Reduction potentials.

(7) Potentiometric titrations.

C. *Kinetics of at least 4 different reactions* and determination of (i) temperature coefficient and (ii) total order.

D. Use of Nutting's photometer and quartz spectro-graph.

This will be common to both thesis and non-thesis candidates, and will carry 100 marks.

Organic Chemistry.

Part I (Compulsory).

Practical—

A. Preparations. (At least 10 preparations should be attempted.)

- (a) Cinnamic acid (Perkin's reaction).
- (b) Hydrocinnamic acid (Reduction with sodium amalgam).
- (c) Salicylaldehyde (Reimer and Tiemann's reaction).
- (d) Quinoline or α -naphthoquinoline (Skraup's reaction).
- (e) *m*-toluidine from *p*-toluidine (5 stage preparation: *p*-toluidine, *p*-acetotoluidide, *m*-nitro-*p*-toluidine, *m*-nitrotoluene, *m*-toluidine).
- (f) Amylnitrite, amylformate.
- (g) Isonitrosocamphor, hydroxymethylene camphor.
- (h) Thioaniline, thioldiphenylamine.
- (i) Phenylhydrazine (2 stage preparation).
- (j) 2-hydroxy-1 : 4-naphthoquinone (4 stage preparation).

(A-naphthol, 2 :—4-dinitro A-naphthol, 2 : 4-diamino naphthol, 2-amino-1—: (4-naphthoquinoimide, 2-hydroxy 1 : 4-naphthoquinone).

(k) Benzylic acid (3 stage preparation).

(l) Sym-tribromobenzene (2 stage preparation).

(m) Simicarbazide hydrochloride (4 stage preparation).

(B). *Quantitative Experiments.*

(1) Estimation of C & H (Combustion. Liebig's method).

(2) Estimation of N (Duma's method).

(3) Estimation of N (Kjeldahls' method).

(4) Estimation of S (By two methods—K MnO₄ oxidation and fusion methods).

(5) Estimation of halogens (By two methods Carius and Piria and Schiff's methods).

This will be common to both thesis and non-thesis candidates, and will carry 100 marks.

Inorganic Chemistry (for students offering thesis)

Qualitative—Common radicals in B.Sc. with ferrocyanide, ferricyanide, thiocyanate, hypochlo-

rite, silicate and thiosulphate, selenium, tellurium, and thallium.

Quantitative—

(a) Analysis of the following two alloys :—

(1) Solder, (2) Aluminium bronze.

(b) Analysis of the following two ores :—

(1) Iron ore, (2) copper pyrites.

(c) The following typical quantitative estimation :—

(1) Fe and Mn, (2) Ba and Ca, (3) Iodate and Iodide.

(d) Antimony and Tin.

(e) Chlorimetric estimation of Nickel.

This will carry 100 marks.

ZOOLOGY

Previous Examination

The course will include a detailed knowledge of the structure, development, bionomics and classification of all the representatives of the principal sub-division of each phylum of the animal kingdom, and their distribution in time and space.

Practical Course.—Candidates will be required to show a detailed knowledge of microscopical tech-

nique, and to describe and dissect representative types of the principal sub-divisions of each phylum of the animal kingdom.

Candidates must produce at the Practical examination their preparations and note-books containing a complete record laboratory work, for which 50 marks are allotted.

There will be four papers and the standard of examination shall be higher than that of the B.Sc. Honours Examination.

	Marks.
Paper I.—Invertebrata Excluding Annelida, Arthropoda and Mollusca ..	100
„ II.—Annelida, Arthropoda and Mol- lusca	100
„ III.—Protochorda, Pisces (with special reference to food fishes of the United Provinces) and Amphibia	100
„ IV.—Aminota	100
Practical (including 50 marks for class record)	250
	<hr/>
Total ..	650

Candidates must obtain minimum pass marks in the Practical Examination, as well as in the total of the theory papers.

Final Examination

The subject for examination shall be any *two* of the following groups :—

Group A—Cytology with special reference to Oogenesis or Genetics (with special reference to animal breeding).

Group B.—Helminthology (with special reference to Trematoda and Cestoda) or Annelida.

Group C.—Pisces (with special reference to Indian Economic types) or Economic Zoology (with special reference to Entomology).

Group D.—Thesis and Essay.

N.B. 1.—The subjects of study in special Groups will be decided a year in advance.

N.B. 2.—Candidates who have passed the M.Sc. Previous Examination will be required to take Paper V also of the B.Sc. Honours Examination.

Group A.—Shall consist of two papers and a practical test.

Paper I	..	..	100	Marks
Paper II	..	..	100	„
Practical	..	..	75	„

General Preparations	..	25	Marks
Group B.—Shall consist of two papers and a practical test.			
Paper I	..	100	Marks
Paper II	..	100	„
Practical	..	75	„
General Preparations	..	25	„
Group C.—Shall consist of two papers and practical test.			
Paper I	..	100	Marks
Paper II	..	100	„
Practical	..	75	„
General Preparations	..	25	„
Group D.—Shall consist of :—			
Essay ..	..	100	„
Thesis ..	..	100	„
<i>Viva voce</i> ..	..	50	„
General Preparations, Collections, Microtomy, etc. ..	..	50	„

Candidates must produce at the Practical examination their preparations and note-books, containing a complete record of the Laboratory

works, which will be taken into consideration in determining the results of the examination.

Candidates must obtain minimum pass marks in the Practical examination as well as in the total of the Theory papers.

ANTHROPOLOGY

M.SC. PREVIOUS.

- PAPER I. Evolution of man. Early human types, Detailed study of Neanderthal and other Upper Palaeolithic races. Palaeolithic culture.
- PAPER II. Anthropometry. Principles of Anthropometry; Racial types illustrated by typical tribes. Racial history of India in detail. Brief racial history of Asia and Europe (including Neolithic races).
- PAPER III. Social Anthropology, (to be taught in the Department of Politics). Social Units: Family, Clan, Tribe, Association. Marriage rules: marriage classes, dual organisation and anomalous types of marriages. Kinship. Father-right and Mother-right. Descent, Inheritance, Rank and Succe-

ssion. Primitive Govt. law and justice.

PAPER IV. Social Anthropology, (to be taught in the Politics Department). Material culture and economic pursuits of primitive man—food collection, food growing, hunting, fishing, agriculture, fire making, cooking, pottery, basketry. Habitations Dress, War weapons. Primitive Economics—barter, exchange, distribution, transport.

Practical :—

- (a) Somatometry, Physical types, Comparative Anatomy.
- (b) Prehistoric tools, specimens illustrating material culture of primitive people.

Marks :—

- (1) Each paper carries 100 marks.
- (2) Practical (a) carries 100 marks.
- (3) Practical (b) carries 50 marks.

M. SC. FINAL.

PAPER I. Physical Anthropology I. Classification and characteristics of the

Primates. Comparative Osteology of the Anthropoidae and Hominidae. Fossil Primates-Fossil men in detail (other than Neanderthal and upper Palaeolithic races). Racial history of Africa, America and Oceania (including Neolithic races).

PAPER II. Physical Anthropology.—Heredity and variations in man, inheritance of bodily traits and of abnormalities. Blood groups. Finger prints and Palmar Patterns, Eugenics, Biometry.

PAPER III. Social Anthropology.—Detailed study of Economic basis of social changes. Primitive Religions, Theories of origin of Magic, animism, taboo, mana, totemism, fetichism, concept of soul and future life. Priesthood, Common festivals. Cultural diffusion, cultural contacts, acculturation.

PAPER IV. Social Anthropology.—Detailed study of the material culture and social organisation of two Indian tribes. Technique of Social and Economic Survey. Statistical treatment of data.

PAPERS III and IV will be taught in the Politics Department.

PRACTICAL.

(a) Craniometry, Osteology, Bloodgroups. Finger and Palmar prints. Cleaning and Preservation of bones and fossils.

(b) Advanced technology, special study of material culture of a tribe. Museum Methods (cleaning, preservation and arrangement of specimens). Field Survey.

Marks :—

PAPERS—100 marks each.

Practical—(a) 100 marks.

(b) 100 marks.

Students who have passed either the B.Sc., degree with Zoology, or B.A. with Politics, or B.Sc. Special Course for Women, will be eligible for admission to the M.Sc., course in Anthropology.

Ordinances regarding percentage of marks for classes will be the same as for M.Sc. and M.A. Examinations in Zoology and Politics.

Candidates will be required to pass *separately* in the total of papers and total of practicals.

Books recommended :—

PREVIOUS M.Sc.

Paper I.

C. P. STIBBE—An Introduction to physical Anthropology.

M. BOULE—Fossil Men.

M. C. BURKITT Old Stone Age.

M. C. BURKITT—Our early ancestors.

HORNIMAM MUSEUM—From Stone to Steel.

P. MITRA—Prehistoric India.

Paper II

A. C. HADDON—Races of Man.

F. D. ANDERSON—The people of India, Chap. I.

R. CHANDA—Indo-Aryan Races.

B. S. GUHA—I. Racial element in the population Census of India 1931, pt. III.

GIUFFRIDA RUGGERI—First outlines of systematic anthropology of Asia (Trans. by H. G. Chakladar.)

W. Z. RIPLEY—Races of Europe.

Papers III & IV.

R. H. LOWIE—Cultural Anthropology.

R. V. SAYCE—Primitive Arts and Crafts.

W. H. R. RIVERS—Social Organisation.

R. H. LOWIE—Primitive Society.

R. THURNWALD—Primitive Society.

FINAL M.Sc.

Physical Anthropology—

Paper I—

F. WOOD JONES—Man's place among mammals.

W. L. DUCKWORTH—Morphology and Anthropology.

M. BOUTE—Fossil Man.

C. G. SELIGMAN—Races of Africa

J. DENIKER—Les races and les Peuples de la terre (1926 edn.).

Paper II—

E. BOUR, E. FISHER & F. LENZ—Human Heredity (trans. by E. & C. Paul).

R. C. PUNNETT—Mendelism.

A. E. TRELOAR—An Introduction to Statistics.

Social Anthropology—

Paper I—

C. WISSLER—Man and Culture.

A. B. DIXON—The Building of Culture.

K. P. CHATTOPADHYAYA—Contact of People as affecting marriage rules (Proceedings, Science Congress. Nagpur, 1931 Session).

R. H. LOWIE—Primitive Religion.

N. K. BOSE—Spring festival in India.

K. P. CHATTOPADHYAYA—Dharma Worship (J.R.A.S.B. 1942).

Social Anthropology, Paper II : —

Monographs on tribes to be studied.

M.Sc Agricultural Zoology

The courses shall be divided into two stages, the M.Sc. Previous and M.Sc. Final, and shall run over two academic years.

The course shall be open to graduates in Science with Zoology or Agriculture with Zoology, Entomology, or Animal Husbandry).

The Examination shall be by :—

(i) Theory papers, (ii) Practical Test, (iii) Thesis or Dissertation and (iv) *Viva voce*, and shall include the following branches of study :—

1. General Principles of Biology.
2. Agricultural Zoology.
3. Economic Zoology with special reference to agriculture and live-stock.
4. Agricultural and Veterinary Entomology both pure and applied.

Or

Animal Physiology and Nutrition, Animal Breeding and Production ; Agricultural and Veterinary Parasitology.

Previous Examination

The course shall comprise :—

A. Theory.

1. *General Principles of Biology* :—Including the facts and theories of evolution and the subjects of variation, heredity, adaptation, selection, isolation, inheritance, sex, biometry and zoogeography.

2. *Agricultural Zoology* :— Comparative Anatomy including knowledge of the structure, development, bionomics. and classification of the main representatives of such phyla of the animal kingdom as are of particular importance in Agriculture and Animal Husbandry : their distribution in time and space.
3. *Economic Zoology* :—The economic importance of Protozoa, Platyhelminthes, Nemathelminthes, Annelida, Arthropoda, Mollusca, Pisces, Amphibia, Reptilia, Aves and Mammalia. Pisciculture, Sericulture, Lac-culture and Beekeeping. Principles of control and their application in relation to animal pests and animal borne diseases of livestock ;parasites and predators.

B. *Practical.*

Candidates will be required—

- (1) To dissect and describe representative types of the sub-divisions of the phyla included in the theory course.
- (2) To show knowledge of microscopical technique.
- (3) To recognise in the field and laboratory

the important animals of economic importance.

- (4) To make their own collection and preparations.
- (5) To produce for examination their preparations, collections, and field notes containing a complete record of the work done in the laboratory or outside.

Marks will be allotted to each branch of study as follows :—

Theory.

Paper I—General Principles of Biology	..	100 marks	} 400 marks
Paper II—Invertebrata	..	100 marks	
Paper III—Vertebrata	..	100 marks	
Paper IV—Economic Zoology	..	100 marks	

Practical

Invertebrata	..	100 marks	} 250 marks
Vertebrata	...	100 marks	
Class record and field work etc.		50 marks	

M Sc. Final Examination.

The course shall be divided into two groups, A and B, and a candidate shall be allowed to take either group A or group B.

Group A

The course shall comprise—

Theory.

1. *Insect Morphology and Anatomy*—Comparative morphology, anatomy, and physiology of the representative types of the order—Thysanura, Orthoptera, Dermaptera. Isoptera, Anopleura, Odonata, Thysanoptera, Hemiptera, Lepidoptera, Coleoptera. Hymenoptera, Diptera and Aphaniptera, Post-embryonic development as illustrated in the above orders of insects, Evolution of insects, their distribution in time and space.
2. *Systematic Entomology*—Principles of taxonomy, zoological nomenclature, and bibliographical indexing. Historical account of classification of insects. Modern system of insect classification, Identification of important insect and their immature stages. Methods of collection and preserving insects and their stages
3. *Economic Entomology* :—Study of the occurrence, spread and biology of principal insects injurious to agriculture and live stock. Insect ecology, Parasitism in

insects. Insect migration; nature and origin of insect pest outbreaks. Principles of control. Methods and appliances employed in controlling insect pests. Insects as vectors of virus diseases. Layout of Entomological experiments and interpretation of data.

4. *Thesis or Dissertation.*— This will deal with the results of original observations, and review of the existing literature on the morphology, anatomy or life history of any insect or insects.

Practical.

Description, dissection and identification of insects, or their stages, or insect pest of crops or live-stock. Microtomy and staining of suitable objects. Pinning and setting of insects, and preservation of stages for identification. Formulæ preparation and application on field scale of insecticides. Knowledge of insect control appliances Rearing of an insect or insects selected for the year Presentation of insect materials in the examination covering the subject in the theory course.

Marks will be allotted in each branch of study as follows :—

Theory papers—

1. Insect Morphology and Anatomy	...	100 marks
2. Systematic Entomology...		100 marks
3. Economic Entomology...		100 marks
4. Thesis or Dissertation ..		100 marks
5. <i>Viva Voce</i>	..	100 marks
		<hr/> 500 marks

The subject of the Thesis or Dissertation shall be announced before the end of the term in the Previous M.Sc. Class.

Practical.

Insect Morphology and Anatomy	..	100 marks
Systematic and Economic Entomology	...	100 marks
Microtomy and class record ..		50 marks
		<hr/> 250 marks

Candidates must pass separately in theory and practical. They must produce for examination their

preparations, collections and note-books containing a record of the work done in the laboratory and the field.

GROUP B.

The course will comprise —

1. *Animal Physiology and Nutrition—Physiology.* Study of the histology of animal tissues, physiology of the muscular, nervous, circulatory, respiratory digestive, excretory, reproductive, endocrine, thermotatic and sensory systems in animals. Coordination of functions and behaviour. The animal in relation to its environments—Regulation. The special physiology of mother and foetus.

Nutrition—The food stuffs, their nature and source. Feeding and feeding mechanism. Digestion, metabolism. Vitamins; the energy requirement of the body. Feeding standards with particular reference to farm animals.

2. *Animal Breeding.*—

(i) Anatomy and cytology of reproductive organs.

(ii) Theories and mechanism of inheritance, Species, varieties, mutations, varitation-natural selection, adaptation, domestication, artificial selection, reversion.

Breeds and pedigrees. Behaviour of chromosomes and their functions. Linkage of characters, sex linkage, sex determination. Galton's Theory. Bruce—low system of breeding. Lines and families. In-breeding, outcrossing, cross-breeding.

(iii) Procreation and development: fertilisation. Embryonic development, foetus, gestation, parturition, post-natal development and nourishment.

(iv) Objects and aims of breeding. Typical breeds of domestic animals and their characteristics. Housing, management and breeding of animals under Indian conditions.

(v) Principles and practice of breeding. Breeding hygiene. Breeding for Indian requirements. Stock accounting.

3. *Agricultural and Veterinary Parasitology.*—Proto-zoology and Helminthology; phenomenon of parasitism and types of parasitic relations; host and organ specificity; effect of parasitism on host and parasite; resistance and immunity. Morphology, life-history, relationship to disease and control of protozoan, helminths and other arthropod parasites of

plants and domestic animals, their life-history, classification, and distribution. Clinical and diagnostic methods.

4. *Thesis or Dissertation*.—Including the results of original observations, and a review of the existing literature in connection with any one of the three courses mentioned above.

The subject of the Thesis or Dissertation shall be announced before the end of the term in the Previous M. Sc. Class.

5. *Practical Work*.—Including (a) Acquaintance with the methods employed for the demonstration of the fundamental and physiological process as laid down in the above syllabus; to carry out such manipulations or simple experiments as are comprised therein; (b) rearing upto three generations, at least, of some animals of agricultural importance (c) microscopical preparation, examination and description of representative types of protozoan and helminth parasites; (d) microtomy and staining of suitable objects.

Candidates must produce for examination their preparations, collections and note books containing a record of the work done in the laboratory and outside.

Candidates must pass separately in theory papers and practical.

Marks will be allotted in each branch of study as follows :—

Theory papers :—

1. Animal Physiology and Nutrition	..	100 marks
2. Animal Breeding	..	100 mark
3. Agricultural and Veterinary Parasitology	..	100 marks
4. Thesis or Dissertation	..	100 marks
5. <i>Viva voce</i>	..	100 marks
<hr/>		
Total	..	500 marks

Practical :—

Animal Physiology, Nutrition and Breeding	..	100 marks
Agricultural and Veterinary Parasitology	..	100 marks
Microtomy and class record	..	50 marks
<hr/>		
Total	..	250 marks

Doctor of Philosophy (Science)

(See ordinance in Chapter XXXVI—D. pp. 55—63)

Doctor of Science

(See ordinance in Chapter XXXVI—E. *vide* pp. 63—71.)

BOTANY**Previous Examination**

Candidates will be required to pass in the written as well as in the practical examination separately.

1. The structure, life-history and affinities of the chief representatives of the principal groups and sub-groups of the Cryptogams.

2. Plant physiology :—metabolism ; movements of solvents and solutes, growth and movements.

3. Cytology :—The structure of the cell ; structure and functions of the nucleus ; the principal types of nuclear division ; the structure of the chromosomes including their morphology translocation and fragmentation ; sex chromosomes ; the chondriome the plastids ; the vacuome and the Golgi material.

There will be three papers:—

Paper 1.—Thallophyta 100 Marks.

„ II.—Bryophyta and Pteridophyta 100 „

„ III.—Plant Physiology and Cytology 100 „

Note—papers I, II and III will be in common with Papers I, II and III of the B.Sc. Honours Examination of the same year.

Practical Examination

The examination will deal with representatives of the chief classes of Cryptogams, and with the technique connected with their study.

The general histology, preparation and study of microscopical sections of plant tissues. The use of stains and other reagents.

Microtomy.

The student will also be required to set up experiments to demonstrate important phenomena in plant physiology.

Preparations and note-books containing a complete record of laboratory work must be produced at the practical examination.

Marks will be allotted as follows :—

Class record	..	..	25
Practical examination	..	..	175
			<hr/>
Total	..	..	200

Final Examination

Candidates will be required to pass in the written as well as in the practical examination separately.
Section 1.

For candidates who appear in the M.Sc. (Final) Examination after passing the M. Sc. (Previous) Examination :—

1. The structure, life-history and affinities of the chief representatives of the principal groups of the *Gymnosperms*.
2. The external morphology, anatomy, life-history, taxonomy and affinities of the *Angiosperms*.
3. Ecology:—The Units of vegetation. Factors of the habitat. Plant Succession. Different types of vegetation with special reference to India.
4. Genetics :—Science of genetics ; heredity and variation ; Mendel's laws of inheri-

tance; the expression and interactions of factors ; the physical basis of inheritance ; linkage and crossing over ; genes and chromosomes ; the nature of the gene ; gene mutations ; cytoplasmic inheritance ; the determination of sex ; inbreeding and heterosis ; genetics of polyploids ; plant chimaeras ; genetics and development ; genetics and evolution.

In addition to the above a candidate shall select, subject to the approval of the Head of the Department, either group A or group B as given below :—

Group A.—Special Papers.

- (i) *Important fungus diseases of crops* in the United Provinces and general principles of bacterial and virus diseases.

The structure and life-histories of fungi causing important diseases of crops ; the nature and effect of the parasitism ; the mode of infection ; the principles and methods of treatment and control the economic aspects of the disease ; a knowledge of any important or recent work done in connection with the fungi studied. A knowledge of the more important symptoms and effects of bacterial and virus diseases.

(ii) *Metabolism in Plant* :—

Synthesis of carbon compounds by green and non-green plants, including the mechanism of photosynthesis ; nitrogen assimilation by green and non-green plants ; the general relation of photosynthesis to Agriculture ; a detailed knowledge of aerobic and anaerobic respiration in plants including the study of oxidising enzymes ; the mechanism of respiration.

Group B. Thesis.

The thesis may be on a problem in mycology, Plant Pathology, Cytology of Fungi or Plant Physiology.

<i>Viva voce</i> 25	} 150 Marks.
Thesis 125	

There will be four papers :—

	Marks
Paper I.—Gymnosperms and Genetics	100
Paper II.—Angiosperms and Ecology	100
*Paper III.—Important fungous diseases of crops in the U. P. inclu-	

* Candidates will be allowed to submit a thesis in lieu of Paper III and Paper IV, and the corresponding practicals. Papers I and II will be in common with Papers IV and V of the B.Sc. (Honours) Examination of the same year.

ding general principles of bacterial and virus diseases ..	50
*Paper IV.—Metabolism in plants ..	50
Total ..	<hr/> 300

Practical Examination.

The examination will deal with representatives of the chief groups of Phanerogams and with the technique connected with their study ; also with the description and the referring of plants and parts of plants of the Angiosperms to their families and their identification with the help of the necessary books.

Preparations and note-books containing a complete record of laboratory work must be produced at the practical Examination.

Marks will be allotted as follows :—

Phanerogams and class record	100	} 150 marks
Fungous diseases ..	25	
Metabolism in plants ..	25	

Section II.

For candidates who appear in the M. Sc. (Final) Examination after passing the B.Sc. (Hons.) Examination :—

A candidate shall select, subject to the approval of the *Head of the Department*, either group A or

group B as given below :—

Group A:

(1) Special Paper I. Fungous diseases of crops in the United Provinces and general principles of bacterial and virus diseases.

The structure and life-histories of fungi causing diseases of crops ; the nature and effect of the parasitism; the mode of infection ; the principles and methods of treatment and control, the economic aspects of the diseases ; a knowledge of any important or recent work done in connection with the fungi studied. A knowledge of the more important symptoms and effects of bacterial and virus diseases.

(ii) Special Paper II :—A detailed study of the phycomycetes.

(iii) Thesis :—The thesis will be on a problem in Mycology, Plant Pathology or Cytology of Fungi.

Marks will be allotted as follows :—

Special Paper I	..	100	}	150	} 450 Marks
Practical	..	50			
Special Paper II	..	100	}	150	
Practical	..	150			
Thesis	..	125	}	150	
<i>Viva voce</i>	..	25			

Group B :

(i) Special Paper I :—Metabolism in Plants. Synthesis of carbon compounds by green and non-green plants, including the mechanism of photosynthesis, nitrogen assimilation by green and non-green plants ; the general relation of photosynthesis to Agriculture ; a detailed knowledge of aerobic and anaerobic respiration in plants, including the study of oxidising enzymes ; the mechanism of respiration.

(ii) Special Paper II :—A detailed study of Biological Oxidations with special reference to plants.

(iii) Thesis :—The thesis will be on a problem in Plant Physiology.

Marks will be allotted as follows :—

Special Paper I	..	100	}	150	} 450 Marks.
Practical	..	50			
Special Paper II	..	100	}	150	
Practical	..	50			
Thesis	..	125	}	150	
<i>Viva voce</i>	..	25			

M.Sc. in Agricultural Botany

The course shall be open to graduates in Science with Botany or Agriculture.

The Examination shall be by :—

- (i) Theory papers.
- (ii) Practical and *viva voce*.
- (iii) Dissertation.
- (iv) Thesis (on a Subject approved by the Head of the Department).

The Examination shall be in the following branches of the subject :—

- (i) Plant Physiology.
- (ii) Soil Science and Agricultural Biochemistry.
- (iii) Mycology and Plant Pathology.
- (iv) Genetics and Plant Breeding.
- (v) Horticulture and Farm crops.

Previous Examination

Candidates will be required to pass in the written as well as in the practical examination separately.

1. Plant Physiology.

Advanced studies in the nutrition of plants ; mineral constituents, their source, absorption and function ; rôle of trace elements ; methods of pot and field experiments for determining soil fertility ; H-ion concentration ; osmotic properties of cell

membrances ; laws of osmosis ; methods of determining the osmotic properties of cellsap ; plasmolysis water balance and water requirements of plants ; draught resistance ; translocation of water ; theories of Ascent of Sap ; transpiration and its relation to environment ; wilting and its physiological significance ; movements of solutes in plants ; respiration, relationship of aerobic and anaerobic respiration ; respiratory quotient and causes of variation in its value ; photosynthesis, its nature and methods of measurements ; factors affecting photosynthesis, the law of limiting factors and its criticisms.

Plastid pigments, their chemistry and functions nitrogen, its sources and absorption, the nitrogen cycle ; growth and factors influencing it ; vernalization ; movements and their significance ; physiology of cold storage.

Books:—

Mayer and Anderson—Plant Physiology.

Barton Wright—Recent Advances in Plant Physiology.

Maximov—Text Book of Plant Physiology.

Miller—Plant Physiology.

Small—Practical Botany.

Palladin—Plant Physiology.

Harvey—Plant Physiological Chemistry.

Kostychev—Chemical Plant Physiology.

Stiles—Photosynthesis.

Dixon—Transpiration and Ascent of Sap in Plants.

Kostychev and Lyon—Plant Respiration.

Curtis—Translocation in Plants.

2. Soil Science and Agricultural Biochemistry.

A. Soil Science.

Formation of soils from pedological principles its chemical, physical and physico-chemical properties ; Rôle of the colloids ; Soil-fertility ; Micro-flora of the soil and the micro-biological processes undergoing in it ; Nitrogen fixation in soils ; Acid and alkali soils and methods of their reclamation.

B. Agricultural Biochemistry.

The composition of plants and their principal products. The formation and natural synthesis of carbohydrates, Proteins and fats. The effect of manurial and other cultural practices on plant metabolism. The composition of plants and their Principal products. The effect of manurial and

other cultural practices on plant metabolism. Composition of feeds and feeding stuffs.

Books :

Cohen—Organic Chemistry, Vols. I, II and III.

Lewis—A System of Physical Chemistry.

Robinson—Soils, Their Origin, Constitution and Classification.

Marshal—Colloids in Agriculture.

Morrison—Feeds and Feeding.

Gartner—An Outline of Biochemistry.

3. Mycology and Plant Pathology.

The structure and life-history of the chief representatives of fungi and their cl
Physiology of fungi.

A detailed study of fungoid diseases of important crops, vegetables and fruit trees of the United Provinces. A knowledge of the more important symptoms and effects of bacterial and virus diseases. Principles and methods of control of plant diseases.

Books :

Stevens—Fungi which Cause Plant Diseases.

Heald—Manual of Plant Diseases.

Butler—Fungi and Diseases of Plants.

Owens—Principles of Plant Pathology.

Bessey—Text Book of Mycology.

Brooks—Plant Diseases.

Fawcett—Citrus Diseases and Their Control.

Smith—Bacterial Diseases of Plants.

Martin—Scientific Principles of Plant Protection.

Gauman and Dodge—Comparative Morphology of Fungi.

Bourcart—Insecticides, Fungicides and Weed-killers.

4. Genetics and Plant Breeding.

Genetics.

Heredity and variation ; mendelism ; the expression and interaction of factors ; multiple factors ; sex-linked and sex-limited factors ; linkage ; crossing over ; the nature of the gene ; genes and chromosomes ; chromosome maps ; gene mutation ; polyploids ; sex-determination ; cytoplasmic inheritance chimaeras ; hybrid vigour.

Plant Breeding.

Methods of crop improvement :—(1) by selection—mass, line clonal, and bud ; (2) by hybridi-

zation inbreeding and outbreeding; (3) by artificial means—X-ray radiation and treatment by chemicals.

Plant breeding technique; familiarity with groups of plants—monœcious, diœcious, etc.; parentage control; plant breeding in foreign countries and in India.

The use of biometry in plant breeding—standard deviation, standard error, normal curve of error, the chi-square test, latin square, randomised block, split plot, analysis of variance and covariance. Cytogenetics of wheat, brassicas and tobacco.

Books :

SINNOT, E. W. AND DUNN, L. C.—Principles of Genetics.

MORGAN, T. W.—The Physical Basis of Heredity.

SNYDER, L. H.—The Principles of Heredity.

WADDINGTON, C. H.—Introduction to Modern Genetics.

DARLINGTON, C. D.—Chromosomes and Plant Breeding.

DARLINGTON, C. D.—Recent Advances in Cytology.

SHARP, L. W.—Introduction to Cytology.

BABCOCK, E. B. and CLAUSSEN, R. E.—Genetics in relation to Agriculture.

SANSOME, F. W. & PHILP, J.—Recent Advances in Plant Genetics.

CRANE, M. B. AND LAWRENCE, W. J. C.—The Genetics of Garden Plants.

HUNTER, H. AND LEAKE, H. M.—Recent Advances in Agricultural Plant Breeding.

MENDIOLA, N. B.—Plant Breeding for the Tropics.

FISHER, R. A.—Statistical Methods for Research Workers.

LOVE, H. H.—The Application of Statistical Methods to Agricultural Research.

SHAW, F. J. F.—A Handbook of Statistics for use in Plant breeding and Agricultural Problems.

PATERSON, D. D. —Statistical Methods for Agricultural Students.

PUGH, B. M. AND DUTT, C. P.—Crop Production in India.

RAMIAH, K.—Rice in Madras.

HAYES, H. K. AND CARBER, R. J.—Breeding Crop Plants.

There will be four papers :—

(i) Plant Physiology	..	100 Marks.
(ii) Soil Science and Agricultural Biochemistry	..	100 Marks
(iii) Mycology and Plant Pathology		100 Marks.
(iv) Genetics and Plant Breeding		100 Marks
Total		400 Marks.

Practical Examination

The Practical examination will deal with the following :—

1. Experiments to demonstrate the main facts of Plant Physiology.
2. Qualitative and quantitative analysis of the chief mineral constituents of the plants and of carbohydrates, proteins and fats.
3. The analysis of soils and fertilisers.
4. Examination and identification of fungi causing diseases of important crops, vegetables and fruit trees of the United Provinces ; preparation of culture media, isolation of pure cultures, methods of sterilization and inoculation ; preparation and application of fungicides; histological technique.

5. Plant breeding technique ; Selection and hybridization of some crop plants, technique in hybridization, field plot technique cytological technique, records.

Preparations and note-books containing a complete record of laboratory work must be produced at the practical examination.

Marks will be allotted as follows :—

Class record	25
Practical examination ..	175
	<hr/>
Total ..	200

Final Examination

Candidates will be required to pass in the written (i.e., in the total marks of the paper, dissertation and thesis) as well as in the practical examination separately.

1. Horticulture and Farm Crops.

A. Horticulture.

Growth habits of deciduous and evergreen fruit trees ; growth of roots and shoots ; effects of plant hormones on growth ; bud differentiation and factors that influence it ; position of fruit buds in different species.

Vegetative propagation; compatibility; root-stock scion reactions; polyembryony.

Orchard soil management; moisture relationships and irrigation; nutrition, results of deficiencies and excesses of various elements; tillage. Problems of fruitfulness; pollination, self and inter-sterility and their causes; parthenocarpy; setting of fruits; irregular bearing habits.

The composition of fruits and its changes during ripening and storage.

The origin and improvement of fruits.

Study of the following fruits in relation to the above, their climatic requirements, and botanical classification:—

Mango (*Mangifera indica*), guava (*Psidium guajava*), citrus fruits (species of *Citrus*, *Poncirus*, and *Fortunella*), banana (*Musa* spp.), jujube (*Zizyphus* spp.), papaya (*Carica papaya*), loquat (*Eriobotrya japonica*), litchi (*Litchi sinensis*), grape (*Vitis* spp.), fig (*Ficus carica*), date (*Phoenix dactylifera*), phalsa (*Grewia asiatica*), pine apple (*Ananas comosus*), custard apple (*Anona* spp.), jackfruit (*Artocarpus heterophylla*) jaman (*Eugenia jambolana*), pomegranate (*Punica*

granatum), carambola (*Ave rhoa carambola*), bael (*Aegle marmelos*), aonla (*Phyllanthus emblica*), mulberry (*Morus* spp.), apple (*Pyrus malus*), pear (*Pyrus* spp.), peach (*Prunus persica*), apricot (*Prunus armeniaca*), plum (*Prunus* spp.), walnut (*Juglans regia*).

Books.

CHANDLER, W. H.—Fruit Growing

GARDNER, V. R., Bradford, F. C., Hooker, H. D.—The Fundamentals of fruit production.

POPENOE, W.—Manual of Tropical and Sub-tropical Fruits.

FIRMINGEY.—Manual of Gardening in India (revised edition by Burns, W.).

BRADFORD, F. C., GARDNER, V. R. AND HOOKER, H. D.—Orcharding.

GORLEY, J. H. AND HOWLETT, F. S.—Modern Fruit Production.

STURROCK, D.—Tropical Fruits for Southern Florida and Cuba and their uses.

HAYES, W. B.—Fruit Growing in India.

B. Farm Crops.

Cultivated plants and their origin ; Differences between wild and cultivated plants ; History of Crop Improvement in India.

A general study of the morphology, biology, physiological plant anatomy, taxonomy, ecology, and culture of cereals, pulses, fibre plants, root crops, and other crop plants of industrial and economic value, e.g., oil-seeds, etc.

Detailed studies, on the above lines, of the following :—

(1) Wheat, (2) Paddy, (3) Cotton, (4) Sugar-cane, (5) Linseed, (6) Sun-Hemp, (7) Maize, (8) Gram, (9) Pigeon-pea and (10) Potato.

Weeds and their control.

Agricultural seed selection and testing.

Books :

DUTT AND PUGH.—Principles and Practices of Crop Production.

ROBBINS—Botany of Crop Plants.

KENOYER—Weeds of Gwalior and adjacent parts of India.

2. Thesis.

The thesis may be on a problem on Plant Physiology or Mycology or Plant Pathology or Cytogenetics and Plant Breeding.

Marks

Thesis	..	200	}	250
<i>Viva voce</i>	&			
Preparation	..	50		

There will be one paper :—

Horticulture and Farm crops .. 100 Marks.

Practical Examination

1. The description and the referring of crop plants and weeds to their families and their identification with the help of books. Physiological plant anatomy of crop-plants.

2. Study of the tropical and sub-tropical fruits mentioned in the syllabus.

3. *Viva voce*.

Preparations and note-books containing a complete record of laboratory work must be produced at the practical examination.

Marks will be allotted as follows :—

1. Horticulture and Farm Crops .. 50 Mark

Doctor of Philosophy (Science)

(See Ordinances in Chapter XXXVI-D, pp. 55—63).

Doctor of Science

(See Ordinances in Chapter XXXVI-E, *vid.* pp. 63—71).

B. Sc. (Ag.) Examination

1. Every candidate shall be required to pass in the following subjects :—

1. Agricultural Economics and Farm Management, Agricultural Engineering, Agricultural Chemistry, and Farm Sciences ;
2. Biological Sciences ; and
3. Any of the following subjects :—
 - (a) Agronomy,
 - (b) Pomology,
 - (c) Animal Husbandry and Dairying.

N.B.—Candidates offering subjects mentioned in 1, 2 and 3 (c) will be exempted from Paper II (Entomology) and the practical Examination in Entomology.

That in order to pass candidates be required to obtain 25% marks in each paper, 33% marks

each practical examination and 33% in the aggregate of each group of subjects.

2. Candidates must also be prepared to submit to the examiners concerned all their note-books of practical and field studies.

1. **Agricultural Economics and Farm Management Agricultural Engineering. Agricultural Chemistry and Farm Sciences.**

Agricultural Economics and Farm Management.

Section A.

(Lest the importance of Farm Management be lost, it is suggested that the syllabus be in two sections ; and that in the final question paper, four questions from Section A, and three questions from Section B, are to be set, of which the candidate is to attempt three question from section A, and two from B).

(a) *Introduction* : Scope and meaning of Agricultural Economics and Rural Economy; Farming as a Business, a biological science and a method of life ; how it differs from manufacturing and industrial business systems of farming ; types of farming.

(b) *Agricultural Geography* : Agricultural Geography with special reference to the United Provinces ;

Agricultural Statistics with special reference to the United Provinces.

(c) *Agricultural Prices* : Nature of Prices ; index numbers ; general price level ; effect of fluctuations in the general price level on farmers and fixedwage earners ; price series available in India ; price variation of agricultural commodities ; price relationships ; long time trend, seasonal variation, cycles.

(d) *Farm Finance* : Rural indebtedness : credit institutions serving agriculture ; the *taqavi* and other forms of agricultural credit

(e) *Cooperative* : Coopertion as a principle ; its application to agriculture ; various forms of farmers' cooperatives in India and abroad : degree of success in India.

(f) *Land Economics* ; Scope of land economics ; land as property, system of tenure, land record and papers ; relation between landlord and tenant ; tenancy and land laws of the U. P. ; economic holdings under different conditions ; consolidation of holdings ; land improvement and development ; population problems as they affect the farmer ; economic effect of shortness or longness of life of the individual.

(g) *Rural Economy* : State and agriculture ; state assistance to science, craft and business of agri-

culture; functions and organization of the United Provinces department of agriculture; the Imperial Council of Agricultural Research and its relation to the farmer; cottage industries; development of village industries, subsidiary to farming

(b) *Agricultural Marketing*; What is meant by marketing Its importance Demand as related to marketing; characteristics of demand, demand curves; supply as related to marketing, supply curve causes of variation in supply. Margin for distribution. Services of marketing; agencies in marketing; market news; future trading; coo perative market-ing; state and marketing

Section B.

(i) *Farm Management*: Measures of profits; factors affecting profits—prices, size of farm business—rates of production of crops and animals, choice and management of livestock; management of labour; calendar of operations; efficiency in the use of farm equipment layout of the farm; location of farm buildings; best time to sell farm products factors determining selection of farm; valuation of farm; capital requirements.

(j) *Farm Book-keeping and Records*: Property accounting, financial accounting, enterprise accounting, complete cost accounting; budgetting.

Books recommended :—

1. O'BRIEN, G. : Agricultural Economic.
Longmans & Co, 1929
- 2 GRAY, L. C. : Introduction to Agricultural
Economics. Macmillan, 1924.
3. COHEN, R L. : The Economics of Agri-
culture. Cambridge University Press,
1940
4. MORRISON, T : The Industrial Organisa-
tion of an Indian Province. John
Murray, London, 1909.
- 5 DUBEY, R. : Economic Geography of
India. Kitab Mahal, Allahabad, 1941.
6. THOMAS, P J. AND SASTRY, N : Agricultural
Statistics. Madras University, 1939.
7. WARREN, G. P. AND Pearson, P. A. :
World Prices and Building Industry.
John Wiley & Son, 1937
8. SHEPHERD, G S. : Agricultural Price
Analysis Iowa State College Press, 1941.
9. GHOSH, B B. : Problems of Agricultural
Credit in India. Modern Pub, Syn.
Calcutta, 1937.

10. RAY, S. C. : Rural Indebtedness in India. Calcutta University, 1915.
11. MATHAI, J. : Agricultural Co-operation in India. C L S. Madras, 1925.
12. BADEN-POWELL : Land Revenue in British India. Clarendon Press, 1907.
13. MISRA, B. R. : Land Revenue Policy in the U. P. Nand Kishore Brothers, Benares, 1942.
14. TAYLOR, H. : Farm and Estate Book keeping Simpkin Marshall, Ltd., London, 5th edition, 1905.
15. Proceedings of the International Conference of Agricultural Economists.
16. Proceedings of the Indian Society of Agricultural Economists.
17. Annual Reports of the Department of Agriculture, U. P.
18. Annual Reports of the Imperial Council of Agricultural Research, Delhi.
19. BHARGAVA, B. N. : Agricultural Marketing, Longmans Green, Calcutta.

20. MUKERJEE, B. B. : Agricultural Marketing in India, Thaker Spink and Co., Calcutta, 1937.
21. MUNSHI, M. C. : From the Farmer to the Consumer. Federation in Indian Chamber of Commerce, New Delhi, 1945.
22. LORENZO, A. M. : Markets Reports (2nd Ed.), Kitab Mahal, Allahabad, 1944.
23. Government of India : Report of Fairs Markets and Produce Exchange in India, Manager of Publications, Delhi.
24. CLERK AND WELD : Marketing Agricultural Products. MacMillan, N. Y. 1941.
25. BLANKERTZ, D. F. : Marketing Cooperatives, Ronald Press, N. Y. 1940.

2. *Agricultural Engineering.*

- (a) Farm machinery : implements and machines used in tillage and cultivation, description, uses and adjustments comparison of indigenous and imported ; implements effect of different implements on the soil ; simple discussion of design to guide students in selecting of implements and machines , materials

used in construction; depreciation and working life as determined by wear and obsolescence; working costs; machines other than cultivation, such as harvesting and feed preparing, to be treated in the same way; pumps and water lifting machinery; kinds, selection, testing; practice in dismantling, repair and erection; testing rate of working; cream separator, butter churn and worker, pasteurization equipment, farm and dairy refrigeration.

(b) Power for farm work; working principles of internal combustion engines, stationary and tractor; electric motors and water power applied to farm work; comparative merits of various forms of power including animal power; application of power to cultivation, hauling cane crushing, threshing, chaff cutting, water lifting and feed grinding; use, care and upkeep of farm engines.

(c) Farm buildings: materials and their economic utilisation, properties and adaptability; simple calculations of

strength of building members ; planning, design and construction methods for dwellings, barns, sheds, stores, silos, roads and culverts ; drawing of floor plans, sections and elevations as simple sketches ; reading engineers plans ; domestic water supply and sanitation, including sewage disposal and ventilation.

- (d) Simple surveying with plane table, prismatic compass, ranging poles and chain for mapping and measuring areas, making maps or plans of fields and determining areas ; recording data in field books and plotting results ; running levels for drains and ditches simple contour mapping and laying out irrigation and drainage systems on such maps ; designing and calculating costs of irrigation and drainage systems, terraces and soil saving dams.

PRACTICAL COURSE

The scope of the practical work is indicated by the syllabus.

Books recommended :—

VAUGH : Farm Building Notes. Allahabad Agricultural Institute, Allahabad.

CULPIN : Farm Machinery. Crossby Lockwood and Sons, Ltd.

VAUGH : Farm Machinery Notes. Allahabad Agricultural Institute, Allahabad.

JONES : Farm Gas Engines and Tractors. McGraw-Hill Book Co., New York.

3. *Agricultural Chemistry.*

- (a) Detailed study of carbohydrates, pentoses, dextrose, sucrose, maltose, lactose and cellulose.
- (b) General study of dextrin, oils and fats, gallic acid, quinine, glucosides, terpenes, amino acids and proteins.
- (c) Elementary study of pH ; enzyme action ; colloids ; fermentation ; constituents and available energy values of milk and other foods ; vitamins ; analysis of the chief constituents of foods ; the chief chemical constituents of plants and animals, their distribution and function ; analysis of

the main constituents of plants ; chemistry of plants growth.

- (d) Soil constituents ; soil colloids ; water and its effect on the soil, water analysis ; plant foods and poisons in the soil ; humification of soils ; the chemical aspects of the nitrogen cycle ; comparison of soil deficiencies in phosphorus and nitrogen.
- (e) Manures : their composition, analysis and evaluation ; composting ; commercial fertilizers.

PRACTICAL COURSE

- (a) Qualitative organic identification : tests for carbohydrates, glycerine, fats proteins, ethyl alcohol, oxalic acid, citric acid, tartaric acid.
- (b) Quantitative analysis : general principles of gravimetric and volumetric analysis ; methods of sampling ; estimation of iron, aluminium, calcium, chloride sulphate, phosphate and carbonate, preparation and standardization of standard solutions.

- (c) Feeds and plant materials ; estimation of moisture, ash, fat, protein, carbohydrates.
- (d) Fats and oils : chemical and physical constants ; specific gravity, iodine value, saponification value, Reichert-Meissl value.
- (e) Milk analysis ; density, fat total solids, ash.
- (f) Soils and fertilizers : estimation of total and available phosphate, nitrogen, and potassium ; soil acidity ; qualitative examination of soils.
- (g) Water analysis ; examination of irrigation water.
- (h) Simple experiment to illustrate enzyme action.

Books recommended :—

WILLIAMS : Introduction to Bio-Chemistry. D. Van Nostrand Co., New York.

INGLE : Manual of Agricultural Chemistry—Ernest Benn Ltd., London (1933).

MAHIN AND CARR : Quantitative Agricultural Analysis. McGraw-Hill Book Co., New York.

PLIMMER: Practical Organic and Bio-Chemistry.
Longmans, Green & Co., London.

HAAS AND HILL : Chemistry of Plant Products.
Longmans' Green & Co., London.

RUSSEN : Soil Condition and Plant Growth.

LING : Dairy Chemistry. Chapman and Hall,
London.

WILEY : Agricultural Analysis.

JOGINDER SINGH : A Text Book of organic
Chemistry for B. Sc. classes. Atma Ram & sons,
Lahore.

4. *Farm Sciences.*

(a) Farm Crops.

(1) Major crops of the United Provinces and the cultural methods used for each Cereals, oilseed crops, fodder crops, forage crops, fibre crops, pulses, sugarcane, potato, and tobacco.

(2) Cropping schemes for various type of farming and for various soil conditions in the United Provinces.

(3) Soil management : tillage, manuring, weeding, irrigation, and drainage.

Books recommended :—

DUTT and PUGH : Principles and Practices of Crop Production in India. B. M. Pugh, Agricultural Institute, Allahabad.

(b) Farm Animals and Their Products.

- (1) Kinds of livestock in India and their importance : dairy and draught cattle, sheep, goats, poultry, horses and other animals.
- (2) General management and feeding of livestock.
- (3) Milk production and utilisation in India.
- (4) Marketing organizations for milk and milk products.
- (5) Manufacture of cream, butter, *dahi*, *ghi*, *khoa* and their importance.
- (6) Other animal products : Wool, meat, hair, eggs, etc.

Books recommended :—

DAVIES : Indian Indigenous Milk Products. Thacker Spink & Co., Calcutta.

MORRISON : Feeds and Feeding. Morrison Publishing Co., Ithaca, New York.

(c) Fruits.

- (1) Soil and climatic requirements.
 - (2) Propagation : purposes and methods of vegetative propagation.
 - (3) Planting : plans, spacing, and methods.
 - (4) Cultivation, irrigation and manuring of orchards.
 - (5) Principles and methods of pruning.
 - (6) Problems of fruitfulness.
 - (7) Principles of fruit preservation.
- (d) Elementary Statistical Methods.

- (1) Standard deviation, normal curve of error, standard error, statistical significance, sampling.
- (2) Analysis of variance of field experiments : Latin and randomized block layout.

Books recommended :—

PATERSON : Statistical Technique in Agricultural Research McGraw Hill Book Co., New York.

The marks will be allotted as follows :—

Paper I—Agricultural Economics Farm Management

Paper II—Agricultural Engineering	50
Practical in Agricultural Engineering	50
Paper III—Agricultural Chemistry	50
Practical in Agricultural Chemistry	50
Paper IV—Farm Sciences	50

2. Biological Sciences.

1. *Agricultural Botany.*

- (a) General principles of biology, including the theory of evolution.
- (b) General classification of plants, relation of natural flora to agriculture and agricultural practice. A knowledge of the following families will be required:—Rutaceæ, Anacardiaceæ, Umbelliferæ, Papaveraceæ, Convolvulaceæ.
- (c) Plant physiology, with special reference to the influence of environmental factors as requirements for and determinants of crop plant development.
 - (1) The soil solution in relation to plant growth.
 - (2) Ascent of sap and transpiration in relation to the intake of materials from the soil.

- (3) Reserve food materials in plants.
- (4) Influence of climatic factors on plant development.
- (5) Toxicity and toxic substances in the soil with special reference to crop plant development.
- (6) Soil factors determining productivity.
- (7) Causes and effects of soil reaction, with particular reference to "acid" and "alkali" soils.
- (8) The nature of the more common fertilizers and manures : their effect on soil and plant.

· PRACTICAL COURSE

- (a) Study of the following families : Papaveraceæ, Rutaceæ, Anacardiaceæ, Leguminosæ, Rosaceæ, Convolvulaceæ and Gramineæ.
- (b) Experiments to demonstrate the main facts of plant physiology.
- (c) Microchemical tests for the more important plant constituents.
- (d) Pot and water cultures.

- (e) Weeds ; recognition, methods of control.

Books Recommended :

PALLADIN : Plant Physiology. Translation by Livingstone. Blakiston.

HOLMAN AND ROBBINS : Text-book of Botany for Universities and Colleges. John Wiley & Sons.

ROBBINS : Botany of Crop Plants. Blakiston.

KENOYER : Weeds of Gwalior and Adjacent Parts of India. Gwalior Department of Agriculture.

RANJAN, SHRI : A Text book of Plant Physiology. Indian Press Ltd., 1945.

MEYER, BERNARD S. AND ANDERSON, DONALD B. : Plant Physiology. Chapman and Hall, Ltd., II, Henrietta Street, London, 1940.

2. *Entomology.*

- (a) A brief account of the phyla of the animal kingdom ; a general survey and classification of the phylum Arthropoda, and of Class Hexapoda, with special reference to insects of economic importance.

- (b) The surface anatomy of the grasshopper, butterfly, beetle and plant bug ;

anatomy of the grasshopper and butterfly.

(c) General physiology of insects.

(d) Survey of insects of economic importance in the U. P. : Those attacking plants, fruits, grains in storage, wood, and animals ; disease carriers ; insectivorous insects ; productive insects (bees, silkworms, lac insects) ; pollinators.

(e) General life history of insects; the following types of life history in more detail : grasshopper (Orthoptera), moth (Lepidoptera), aphid (Hemiptera), lady bird beetle (Coleoptera), mosquito (Diptera).

(f) General ecology of insects ; influence of environment on distribution, periodicity, abundance and activities.

(g) Methods of control of harmful insects ; control in nature by other insects, birds and other animals ; control by man, spraying, poisoning biological control and other methods.

PRACTICAL COURSE

- (a) Examination and dissection of grasshopper, butterfly, and a plant bug ; external features of a beetle and a fly.
- (b) Rearing and study of an insect of economic importance through its life history.
- (c) Collecting, pinning and naming of 100 species of insects.
- (d) Field study of habits, life histories and economic importance of major local insect, pests.
- (e) Study of control methods in the field ; preparation and use of the following insecticides : lead arsenate, Paris green, nicotine solutions, oil emulsions.

Books recommended :—

LEFROY : Indian Insect Life. Thacker, Spink & Co., Calcutta.

LEFROY : Indian Insect Pests. Government Press, Calcutta.

IMMS : Text-book of Entomology. Metheun & Co., London.

COMSTOCK : Text-book of Entomology. Comstock Publishing Co., Ithaca, N. Y., U. S. A.

QUAYLE, HENRY J. : Insects of Citrus and other Subtropical Fruits. Somstock Publishing Co., Ithaca, New York, 1941.

LEACH, JULIAN GILBET : Insect Transmission of Plant Diseases. McGraw-Hill Book Company, New York, 1940.

Handbook of Economic Entomology for South India by Ayyar T. V. R. Government Printing Press Madras, 1940.

BEESON, C. F. C. : Ecology and Control of the Forest Insects, 1941.

3. *Plant Pathology.*

(a) Principles of plant pathology ; nature of disease in plants ; chief disease inciting factors, external and internal.

(b) Nature of fungi ; study of the important members of the following classes of fungi : Phycomycetes, Ascomycetes, fungi imperfecti, Hemibasidiomycetes, Protobasidiomycetes.

(c) General classification, dissemination principles and methods of control of major

diseases of fruit, farm and vegetable crops of the U. P., to include the following:—White rust of cruciferae, Cystopus; downey mildew, Peronospora; blight and damping off. Phytophthora, Pythium; leaf curl, Exoascus; powdery mildews, Erysiphaceae, sooty moulds, Capnodium, Meliola; canker, Nectria; smuts and bunts, Ustilaginaceae and Tilletiaceae; rusts, Puccinia; leaf spots, Phyllosticta, Phoma Cercospora, Alternaria; red rot of sugarcane, Colletotrichum falcatum; wilts and rots. Fusarium, Penicillium; mosaic disease.

- (d) Study of Orobanche, Cuscuta, Loranthus and lichens.

PRACTICAL COURSE.

- (a) Collection and examination of the diseases listed in (c) of the theoretical course.
- (b) Sreparation of cultural media; potato-mush agar, Brown's synthetic medium.
- (c) Preparation of cultures and slides.

Books recommended :—

HEALD : Principles of Plant Pathology.

BUTLER : Fungi in Relation to Diseases in Plants. Thacker, Spink & Co., Calcutta.

OWENS : Principle of Plant Pathology. John Wiley & Sons, Inc.

CHESTER, K. STARR.—The Nature and Prevention of Plant Disease. The Blakiston Company, Philadelphia. 1942.

LEACH, JULIAN GILBET : Insect Transmission of Plant Diseases. McGraw-Hill Book Company, New York. 1940.

AYYAR, T. V. R. : Handbook of Economic Entomology for South India. Government Printing Press, Madras. 1940.

BEESEON, C F. C. : Ecology and Control of the Forest Insects. 1941.

4. *Bacteriology.*

(a) Relation of bacteria to their environment ; bacteriology in relation to agriculture : bacteria of water, soil, and food (including milk).

(b) Form, structure and movement of bacteria.

- (c) Physiology of bacteria in relation to production of colour, light, heat, putrefaction, fermentation, sterilization, pasteurization, pathogenic activity.

PRACTICAL COURSE

- (a) Familiarity with apparatus, instruments and laboratory rules.
- (b) Preparation of culture media : bouillon, nutrien agar, litmus milk.
- (c) Bacterial counts from air, water and milk.
- (d) Examination of cultures, forms of colonies and isolation.
- (e) Staining of bacteria : methylene blue, Gram's methods of staining.
- (f) Microscopic examination and measuring of bacteria.

Candidates must be prepared to submit to the examiner all their permanent slides and practical note-books.

Books recommended:—

CONN : General Bacteriology. Macmillan.

MARSHALL : Microbiology. Blakiston.

BUCHANAN, ESTELLE D. AND BUCHANAN, ROBERT

PARLE : Bacteriology. The MacMillan

Company, Calcutta. Fourth Edition.
1940.

FROBISHER, MARTIN : Fundamentals of Bacteriology. W. B. Saunders Company, London, 1945.

CHALMERS C. H. : Bacteria in Relation to the Milk Supply. Edward Arnold & Co. London, 1939.

5. *Plant Breeding.*

- (a) Variation, heredity and selection with reference to plant improvement.
- (b) Variation : nature and amount ; fluctuating variation and mutation.
- (c) Heredity ; inheritance of morphological and physiological characters.
- (d) Selection and fixation of new forms.
- (e) Mendelism, hybridisation ; technique and experimental methods.

PRACTICAL COURSE

Technique of cross-pollination : emasculation, bagging, etc. Records should be kept giving complete descriptions of parents and offspring.

Books recommended :—

JONES : Genetics in Relation to Plant and Animal Improvement. John Wiley & Sons.

BABCOCK and CLAUSEN : Genetics in Relation to Agriculture. McGraw-Hill Book Co.

The marks will be allotted as follows :—

	Marks.
Paper I.—Agricultural Botany and	
Plant Breeding	50
Practical examination ..	50
Paper II.—Entomology ..	50
Practical examination ..	50
Paper III.—Plant Pathology and Bac-	
teriology	50
Practical examination ..	50

3. (a) Agronomy.

1. *Forage crops :*

Acreages in India under all crops, under forage crops ; in the United Provinces, under all crops and under forage crops.

Forage crops ; fodder crops ; soiling crops ; silage crops ; nurse crops ; companion crops ; hay ; straw ; chaff (*bhusa* and *bhusi*) ; pasture ; meadow.

Choice of forage crops ; manuring ; weeds and their control ; deferred and rotational grazing ; Hohenheim system of grazing ; carrying capacity of a pasture ; yields of forage or fodder.

Hay and hay-making ; composition, digestibility and palatability of important forage and fodder crops ; silos, silage and silage making.

Origin and history ; botanical characters, especially those that are of economic importance ; climatology ; culture ; field control of common diseases and pests, and utilization of the following crops when used for fodder or for pasture : —

Juar (*Andropogon sorghum*), maize, *bajra* or *bajri* (*Pennisetum typhoideum*), lucerne or alfalfa, oats, berseem or Egyptian clover (*Trifolium alexandrium*), Napier or elephant grass (*Pennisetum purpureum*), Guinea grass (*Panicum maximum*), *guara* (*Cyamopsis psoralioides*), mangels or man-golds (*Beta vulgaris*), and monsoon grasses.

2. Cereals :

Distribution and economic importance in the world, in India.

Origin and history, botanical and agronomic characteristics of important varieties, classification, culture, field control of diseases and pests, improvement and storage of each of the following :—

Wheat, rice, barley, oats, *juar* (*Andropogon sorghum*), maize, *bajra* (*Pennisetum typhoides*), and other millets.

3. *Miscellaneous Crops :*

Origin history, botanical and argonomic characteristics, classification, adaptation culture, diseases and pests, and improvement of the following crops:—

Cotton, sugarcane, potatoes, tobacco, pulses, groundnuts, castor, linseed, mustard, sunnhemp patunn, safflower, seasmum.

PRACITCAL COURSE

Acquaintance with the crops mentioned in the syllabus; varietal trials, manurial trials and testing of cultural methods, all under field conditions, modern methods of field experimentation to be used ; records of field experiments.

Books recommended :—

HUNTER and LEAKE : Recent Advances in Agricultural Plant Breeding, J & A. Churchill Portman Square, London.

ROBBINS : Botany of Crop Plants. Blakiston. Philadelphia.

SHAW : A Hand-Book Statistics for Use in Plant Breeding and Agricultural Problems. Imperial Council Agricultural Research, New Delhi.

JOHN PERCIVAL : The Wheat Plant. Cambridge University Press, England.

NOEL DEERR : Cane sugar, Norman Rodger, 2nd St. Dunstan's Hill, London.

GHANDI : The Indian Sugar Industry. 135 Canning Street, Calcutta.

SNOWDEN : The Cultivated Races of Sorghum. Kew Herbarium, London.

PATERSON : Statistical Technique in Agricultural Research. McGraw-Hill Book Co., New York.

WISHART and SANDERS : Principles and practice of Field Experimentation. The Empire

- Cotton Growing Corporation, Kings Buildings, Dean Stanley Street, London.

BUTLER : Fungi in Relation to Disease in Plants, Thacker, Spink & Co., Calcutta.

FLETCHER : A Hand-Book of Crop Pests in Bihar and Orissa. Imperial Agricultural Research Institute, Pusa.

MAXWELL LEFROY : Indian Insect Life. Imperial Agricultural Research Institute, Pusa.

KENOYER : The Weeds of Gwalior and Adjacent Parts of India. Gwalior Department of Agriculture of Baptist Mission Press, Calcutta.

TODULINGAM and VENKATANARAYANA : Hand-Book of Some South Indian Weeds. Superintendent, Govt. Press, Madras.

PIPER : Forage Plants and Their Culture. Macmillan Co., New York.

MORRISON : Feeds and Feeding. Morrison Publishing Co., Ithaca, New York.

Journals for reference :

Indian Journal for Agricultural Science. Publication of the Imperial Council of Agricultural Research, New Delhi.

Indian Farming Publication of the Imperial Council of Agricultural Research, New Delhi.

Journal of Agricultural Science. Cambridge University Press, Fetter Lane, London.

Journal of Agricultural Research. Publication of the U. S. Department of Agriculture, Washington, D. C., U. S. A.

Soil Science. Williams & Wilkins Co., Mt. Royal and Guilford Avenue, Baltimore, Maryland, U. S. A.

Journal of the American Society of Agronomy. Published by the Society, Geneva, New York.

HART, V. B., BOND, M. C. and Cunningham, L. C. : Farm Management and Marketing McGraw-Hill Book Co. 1942.

FOREST, G. W. : Farm Organization and Management. Prentice-Hall, 1941.

APP, F. AND WALLER, A. G. : Farm Economics. J. B. Lippincott Co., N. Y., 1938.

ADAMS, R. L. : Farm Management. MacGraw-Hill Book Co., 1921.

WARREN, G. F. : Farm Management. Macmillan, Rev. Ed., 1940.

HOPKINS, J. A. : Farm Records. Iowa State College Press, 1942.

MITCHELL, D. R. : Farm Accounting, McGraw-Hill Book Co., 1942.

I. C. A. R. : Report on Cost of Production of Crops, Vol. III, 1939.

The marks will be allotted as follows :—

Paper I.—Forage, Crops and Cereals	..	50
Paper II.—Miscellaneous Crops	..	50
Practical—Examination in Forage, Cereals and Miscellaneous Crops	..	50

3. (b) Pomology.

1. *Principles of Fruit Production.*

(a) Introduction : opportunities of developing fruit production in India ; economic advantages ; value of fruit in the diet ; fruit on the general farm, and as a speciality.

(b) Selection of site : soil and climatic requirements ; water supply ; labour : markets : transportation.

- (c) Preliminary operations: laying out farm; grading; irrigation system; fencing and hedging; windbreaks.
- (d) Propagation: seedlings; selection of seed; seedbed management; nursery practices; vegetative propagation, (advantages; methods: separation, cuttings, layering, air-layering, grafting, budding); rootstocks: influence on scion, compatibility, desirable characteristics.
- (e) Planting: systems; spacing of plants; laying out of orchard; preparing nursery plants; transplanting; securing plants from commercial nurseries.
- (f) Cultivation: objects; importance; methods and tools; inter-cropping young orchards.
- (g) Irrigation: necessity; time; methods.
- (h) Manures: value; kinds; methods of applying; green manures; effect on bearing.
- (i) Pruning: purposes; time; Systems; methods and tools; treatment of wounds.
- (j) Pests: common diseases and insect pests; programme for orchard hygiene; spray-

ing, dusting, fumigation, clean culture, pruning, biological control, resistant varieties; bird and animal pests and their control.

- (k) Thinning : purposes ; methods.
- (l) Problems of fruitfulness alternate bearing : causes, control.
- (m) Harvesting : time, methods.
- (n) Marketing : grading ; packing ; types of package ; shipping ; methods of whole sale and retail selling ; co-operative marketing.
- (o) Horticultural products : drying ; canning ; jam and jelly ; pickles ; sauce ; Indian pickles and preserves ; freezing.
- (p) History and literature of horticulture ; History of fruit growing ; origin of cultivated fruits ; standard books , horticultural journals.

2. *Tropical and Subtropical Fruits.*

Each of the following fruits to be studied with reference to the various subjects considered in the section, "Principles of Fruit Production," with emphasis on departures from ordinary practice. In

addition, the botanical classification and important varieties to be studied. Mango, Mandarin orange, sweet orange, pummelo, lime, lemon, other citrus fruits, bael, wood apple, guava, other members of the family Myrtaceæ, custard apple, other Annonas—papaya (including papain production), litchi, pomegranate, jujube, fig, date, sapodilla, loquat, banana, pineapple, jackfruit, phalsa, *anola* (*Phyllanthus emblica*), carambola, persimmon, grape, mulberry, apple, pear, quince, peach, plum, apricot, cherry, strawberry, and bramble fruits.

PRACTICAL COURSE

The scope of the practical work is indicated by the syllabus.

Books recommended :—

POPENOE ; Manual of Tropical and Subtropical Fruits. Macmillan.

FIRMINGER : Manual of Gardening for India, 7th edition, edited by W. Burns. Thacker, Spink & Co., Calcutta.

GARDENER, BRADFORD and HOOKER : Orchard-ing. McGraw-Hill Book Co.

CHANDLER : Fruit Growing. Houghton Mifflin Co.

HUME : The Cultivation of Citrus Fruits. Macmillan.

CRUESS : Commercial Fruit and Vegetable Products. McGraw-Hill Book Co.

HAYES, W. B. : Fruit Growing in India, Kitabistan, Allahabad, 1945.

The marks will be allotted as follows :—

Paper I.—Principles of Fruit Production .. 50

Paper II.—Tropical and Subtropical Fruits 50
 Practical Examination in Principles of
 Fruit Production and Tropical and Sub-
 tropical Fruits 50

3. (c) ANIMAL HUSBANDRY AND DAIRYING.

1. *Animal Husbandry.*

(a) Milk Production and Herd Management.

The theory of and factors related to and effecting milk secretion : care and management of herds of dairy and draught cattle ; common problems of management of sheep, goats and poultry an a mixed farm ; study of milk records and milk recording organizations ; fitting of animals for show and for sale ; cost of production studies ; judging dairy cattle.

(b) Feeding.

Food nutrients and their metabolism ; measure of the usefulness of food nutrients ; feeding standards and their uses ; basal metabolism ; nutritive requirements for maintenance, growth, reproduction, production and work.

2. *Animal Breeding and Hygiene.*

(a) Breeding.

Indian breeds of cattle, goats and sheep, their origin, history, type, adaptability, performance and distribution ; breed associations, their organization and relation to breed improvement ; genetic principles and their application to the improvement of farm animals ; physiology of reproduction ; reproductive efficiency ; artificial insemination.

(b) Hygiene.

Elementary anatomy and physiology ; live stock sanitation ; diagnosis, causes, general measures of prevention and treatment of infectious and contagious disease and common ailments ; simple surgery ; obstetrics ; first aid ; external and inter-

- nal parasites and methods of control ;
castration ; dehorning ; shoeing of work
animals.

PRACTICAL COURSE.

The scope of the practical work is indicated by the syllabus.

3. *Milk and Milk Products.*

(a) Market Milk

The quality of milk and its relation to public health ; milk standards ; problems in the supply and demand of milk in rural and urban areas in India ; collection and processing of milk ; types of organizations ; handling milk ; retail distribution and sales organizations ; handling of surplus milk ; milk inspection ; fermentations common in milk.

(b) Milk Products.

Economic considerations in the manufacture of milk products. Cost accounting in the dairy industry

Butter : Quality of milk and cream for butter making ; separation of milk ; processing of cream for butter making ; preparation and propagation of

butter starters; churning; preparation for market; storage, butter standards; marketing.

Ghi : Importance of the *ghi* industry; methods of manufacture; *ghi* quality marketing.

Khoa and other indigenous products such as *chhana* and *milai* Importance; preparation; marketing.

Dahi : Handling and processing of milk for *dahi* : preparation; quality; marketing

Ice cream : Importance and possible development; manufacture; marketing; *kulfi*

Cheese : Problems involved in cheese manufacture in India; types of cheese; preparation of cheddar type cheese; preparation of soft cheese; storage; marketing.

Condensed milk, dry milk and casein : Condensed and dry milk products, with a brief outline of the methods of manufacture; casein manufacture and its uses.

(c) Dairy Chemistry.

Detailed study of the physical, colloidal and chemical properties of milk and milk products.

PRACTICAL COURSE

The scope of practical work in market milk and milk products is indicated by the syllabus.

Dairy chemistry : Quantitative and qualitative analyses of whole milk, skim milk and cream ; determination of physical and chemical constants of butter, fat, detection of adulteration of milk and *ghi*.

Books recommended :—

ECKLES : Anthony and Palmer : Dairy Cattle and Milk Production. Macmillan, London.

ESPE : Secretion of Milk. Iowa State College Press, Ames, Iowa.

MORRISON : Feeds and Feeding. Morrison Publishing Co , Ithaca, New York.

MAYNARD : Animal Nutrition. McGraw-Hill, New York.

HALNAN AND GARNER : The Principles and Practice of Feeding Farm Animals. Longmans Green & Co., London.

LUSH : Animal Breeding Plants. Iowa State College Press, Ames, Iowa

RICE : Breeding and Improvement of Farm Animals. McGraw-Hill, New York.

ANONYMOUS : Some diseases of Cattle in India.
A Hand-book for Stock Owners. Govern-
ment of India Central Publishing Branch,
Calcutta. No. A. R. 15.

SOMMER : Market Milk and Related Products.
Olsen Publishing Co., Milwaukee, Wiscon-
sin.

HARVEY AND HILL : Milk Production and
Control. H. F. Lewis, London.

DAVIES : The Chemistry of Milk. Chapman
and Hall, London.

LING : A Text-Book of Dairy Chemistry.
Chapman and Hall, London.

DAVIES : Indian Indigenous Milk Products.
Thacker, Spink & Co., Calcutta.

ECKLES, COMBS AND MACY . Milk and Milk Pro-
ducts. McGraw-Hill, New York.

MORTENSEN : Management of Dairy Plants.
Macmillan, New York.

HUNZIKER : Butter Industry. Published by O.F.
Hunziker, Director Research Laboratory,
Blue Valley Creamery Company, Chicago.

SOMMER : Theory and Practice of Ice Cream
making. Olsen Publishing Co., Milwaukee,
Wisconsin.

PRICE : Cheese Orange Judd, New York.

HUNZIKER : Condensed Milk and Milk Powder.
Published by O.F. Hunziker, Director
Research Laboratory, Blue Valley Creamery
Company, Chicago.

The marks will be allotted as follows :—

Paper I.—Animal Husbandry	..	45
Paper II —Animal Breeding and Hygiene		40
Practical in animal Husbandry and Animal Breeding and Hygiene	..	50
Paper III —Milk and Milk Products	...	65
Practical	..	50
		<hr/> 250

B.Sc. (Agr. Engr.) Examination

1. Every candidate shall be required to pass in the following subjects :—

- (1) Advanced Shopwork Practice, Engineering, Drawing and Structural Design, and Agricultural Structures.
- (2) Materials of Construction and strength of Materials, Mechanics, and Statics, Agricultural Machinery, and Principles of Electricity Machinery.

(3) Farm Management. Soil and Water
Conservation (including surveying)
Machine Design.

1. In order to pass, candidates be required to obtain examination 25% marks in each paper, 33% marks in each practical examination and 33% marks in the aggregate of each group of subjects.

2. Candidates must also be prepared to submit to the examiners concerned all their note-books of practical and field studies.

Advanced Shopwork Practice, Engineering
Drawing and Structural Design, and
Agricultural Structures

1. *Advanced Shopwork.*

(a) *Woodworking*—Use of hand and power tools in sawing, planning, fitting, and shaping wood; lathe work; painting, finishing and glazing; repair of furniture and wooden articles; making of patterns for foundry practice.

(b) *Hand and Machine*—bending, twisting, drawing, shaping of steel in forge fire and by presses, drop stamps, and forging machines, forge welding and

making small articles in forge fire; case hardening and heat treating of metals

(c) *Foundry*—simple pattern making, moulding, annealing malleable casting, and chilling.

(d) *Machining*—practice with lathe, milling, drill press grinding and polishing

(e) *Welding*—oxyacetylene and arc welding practice

(f) *Fitting*—casting, machine finishing, filing and scraping of bearings; rope splicing; elementary wiring; repair of farm machinery.

Books recommended :—

JONES : Farm Shop Practice. McGraw-Hill Book Co., New York.

SHAW AND EDGAR : Pattern Making. Sir Isaac Pitman & Sons.

COLE : Tool Making. American Technical Society.

WENDT : Foundry work. McGraw-Hill Book Co.

ATKINS : Electric arc and Oxy-Acetylene Welding, Sir Isaac Pitman & Sons.

MOLLOY : Fitting Practice. Vol. II, Chemical Publishing Co., Inc.

2. *Engineering Drawing and Structural Design.*

(a) *Engineering Drawing*—the use of compasses, pens, scales. T-square, triangles, pencils, and drawing board ; mechanical lettering, both capitals and lower case letters ; simple projection to include lines, planes, solids ; isometric projection, elevation, and cross-section ; development of surfaces of cylinder and cones ; construction of charts, graphs, and curves ; technical sketching ; dimensioning, standards and conventions ; detail and assembly drawings of machines and structures ; tracing and blue printing.

(b) *Structural Design*—stresses in beams, girders, columns, and trusses, algebraic and graphic methods of analysis ; introduction to design of steel structures ; masonry and concrete construction, mechanics of reinforced concrete and brick, design of simple reinforced and brick structures, foundations, and earth pressure.

PRACTICAL COURSE

The scope of the practical course is indicated by the syllabus.

Books recommended:—

DESPANDE AND KULKARNI : A Text-Book of Reinforced Concrete. G. J. Kulkarni, Poona.

FRENCH : Engineering Drawing. McGraw-Hill Book Co.

JONES : Machine Drawing and Design, Vols. I, II, III and IV.

MORRIS : Geometrical Drawing. Longmans Green & Co.

HIGBEE : The Essentials of Descriptive Geometry. John Wiley & Sons.

MEARS : A Students' Course in Reinforced Concrete. The Concrete Association of India.

Steel (Construction). American Technical Society.

3. *Agricultural Structures.*

(a) *Planning*—arrangement of buildings ; planning farm buildings in regard to human and livestock requirements, economy, and convenience ; sanitation ; appearance, and materials used.

(b) *Construction*—details of construction, cost estimating, specifications, bills of materials, and calculations of strength of buildings.

(c) *Utilities*—domestic water supply and sanitation; sewage disposal; ventilation; stove installation; fencing.

Book recommended:—

EOSTER AND CARTER : Farm Buildings.

EKBLAW : Farm Structures. The Macmillan Co., New York.

The marks will be allotted as follows :

Advanced shop Practical	..	..	60
Paper I—Engineering, Drawing and structural	..	..	70
Engineerig Drawing and Structural Design Practical	..	..	60
Paper II—Agricultural Structures	..	..	60

Materials of Construction and Strength of Materials. Mechanics and Statics. Agricultural Machinery and Principles of Electrical Machinery.

1. *Materials of Construction and Strength of Materials.*

(a) *Manufacture*—details of manufacture of steels, cement, brick, and tile.

- (b) *Properties of Materials*—Properties of steel, concrete, wood, brick the title ; specifications and tests of these materials.
- (c) *Use*—Application of steel, wood, concrete, and brick to engineering construction.
- (d) *Testing*—experimental determination of physical properties of steel, timber, concrete, brick and tile ; determination of relative strengths of concrete mixes and the influence of aggregate, cement, and water on the strength of concrete.
- (e) *Materials*—stress, strain and modulus of elasticity ; materials in tension, compression and in shear ; elastic limit, yield point, and breaking stress ; working stresses and factor of safety ; strength of thin cylinders ; riveted joint ; bending and bending moments ; modulus of a section and strength of a beam twisting and a torque ; strength of a shaft subject to pure twist.

Books recommended :—

POORMAN : Strength of Materials. McGraw-Hill Book Co.

MORLEY : Strength of Materials. Longmans
Green & Co.

2. *Mechanics and Statics.*

(a) *Algebra*—use of logarithms ; practical use of the slide rule ; quadratic equations involving one or two unknown quantities.

(b) *Force*—units of force : parallel forces ; parallelogram and triangle of forces ; centres of gravity ; resultant and component of forces ; practical applications.

(c) *Motion*—speed, velocity, and acceleration ; angular velocity and angular acceleration ; mass and momentum ; mass and acceleration ; simple harmonic motion ; engineering units ; vectors ; motion of a body in space ; four bar linkage ; velocities in link work ; instantaneous centres ; acceleration diagrams ; cams ; rolling contact, and gears, trains of mechanisms.

(d) *Work*—the diagram of work ; the principle of work and its application to simple machines ; friction, efficiency, and lubrication ; work done in cylinder of a steam engine ; work done by pumps and motors.

- (e) *Power*—Work done in a given time; the units of power; the indicated horse-power of an engine; transmission of motion and power by belts, shafts, and gears; brake horse-power and mechanical efficiency of an engine; pounds of steam and coal per horse-power hour.
- (f) *Energy*—definitions and calculations; potential and kinetic energy.
- (g) *Thermodynamics*—elementary treatment of the properties of gases and vapours and their uses in motors and refrigerating machines; elementary treatment of the use of tables and diagrams giving the properties of steam.

Books recommended:—

McKAY : Theory of Mechines. Edward Arnold & Co., London.

Low : Applied Mechanics. Longmans Green & Co.

INCHLEY & MORLEY : Elementary Appiled Mechanics. Longmans Green & Co.

VALLANCE AND FARRIS : Principles of Mechanism. Macmillan Co., New York.

POORMAN: Applied Mechanics. McGraw-Hill
Book Co.

3. *Agricultural Machinery.*

- (a) *Introduction*—mechanics ; transmission of power ; element of a machine ; selection of farm machines.
- (b) *Farm Machinery*—The plow bottom and its parts ; plow accessories ; mold-board plow types ; disc plows ; plow design ; plow hitches ; plow troubles, adjustments, and cost of operation ; laying out fields for plowing ; harrows, land rollers and drags ; seeding machinery for small grains ; planting in rows ; calibration and adjustment of seeding machinery various cultivation machines, adaptations, and adjustments ; hay harvesting machinery, grain threshers, combined harvester ; thresher ; cotton ginning ; burr grinders, hammer mills, and silage cutters ; seed cleaners and grappers ; refrigeration machinery.
- (c) *Farm Power*—power on the farm ; make-up of simple gas engine ; principles of operation ; stationary engine types,

speed, piston displacement and compression ; tractor engine type and construction ; valves and valve operation ; fuels and combustion ; fuel and carburetion systems ; air cleaners ; cooling and cooling system, governing and governing system ; ignition methods ; diesel engine construction and operation ; storage batteries ; mechanical generation of electricity ; electric generators ; lubrication and lubricating systems ; clutches ; tractor transmissions, differentials, final drives, and accessories ; tractor chassis, traction devices, pneumatic tires and steering mechanisms ; power and its measurement ; fuel consumption ; engine efficiency ; tractor power transmission ; ratings ; Nebraska tests ; tractor types : economics and selection of the farm tractor : comparative merits of various forms of power including animal power ; application of power to cultivation, hauling, cane crushing, threshing, chaff cutting water lifting, and feed grinding.

PRACTICAL COURSE.

The scope of the practical course is indicated by the syllabus.

Book recommended:—

CULPIN : Agricultural Machinery, Cross by Lockwood & Sons, Ltd.

VAUGH : Farm Machinery Notes. Allahabad Agricultural Institute, Allahabad.

SMITH : Farm Machinery and Equipment. McGraw-Hill Book Co.

4. *Principles of Electric Machinery.*

Elementary—Definition of ampers Volt, ohm, watt and Board of trade unit, Ohm's law, series and parallel circuits, krichoff's laws and simple circuit solution. Calculation of specific resistance and effect of temperature on the specific resistance of materials.

Measurement of Resistances Principle and use of Wheatstone bridge, Post Office box, ammeter and voltmeter method, substitution method and comparison method, Principle of D. C. Potentiometer insulation test of cable, commercial sizes of wires.

Electrical Power and Energy: To determine power in an electrical circuit—kilowatt and horse power. Use of heating effect of current, electrical heaters and stores. Calculation of electrical energy in an electrical circuits.

Elementary treatment of Electro-magnetism—Magnetic lines of flux magnetic field about a straight wire, thumb rule for wire, Field about a coil, thumb rule for a coil. Electro magnets. Magnetic circuits applied to generators. Ohm's law for the magnetic circuits, typical B. H. curves. Hysteresis losses. Eddy current.

D. C. Generators : Elementary construction and Principle of operation. E. M. F. equation, Idea of armature reaction. Different types of generators. Elementary idea of their characteristics and use. Idea of copper losses, magnetic losses eddy current losses and mechanical losses and efficiency calculations. Calculations regarding terminal voltage line current, etc. Elementary idea of parallel operation and switch board diagram with its essentials, two wire generator and three wire generator—Regulation.

D. C. Motor : Construction and Principle of operation. Different types of motors, their speed and load characteristics. Calculations on speed, torque back E. M. F. current and efficiency. Simple speed regulations.

Storage battery—Principle and construction of lead and Edison cell. Charging, discharging care, operation and use of storage battery.

Alternating current: Principle of alternating current generators. Mathematical and vector representation of sine wave form and simple calculation, difference phase. Resistance, reactance, capacity and impedance. Series and parallel circuits. Series and parallel resonance. Simple circuit calculation. Three phase balanced circuits. Power factor in single phase and poly phase circuits. Calculation of power and energy.

A. C. Generator: Construction and principle (Fundamental wave form only) E. M. F. equation excitation. Idea of armature reaction, synchronous reactance and short circuit current. Elementary idea of parallel operation and load factor. Definition of voltage regulation and voltage regulator. Simple calculation on frequency, speed, reactance drop, terminal voltage, line current, efficiency, etc. Star and Delta connection.

Transformers—Construction and Principle. Ratio of transformation. Different types of transformer. Single phase and three phase transformers. Different methods of connections. Voltage regulation (neglecting no load current). Calculation on voltage, current power, ratio of transformation, Limitation of rating of transformers. Heating and cooling of transformers.

A. C. Motors : Construction and working of synchronous Induction and commutator motors. Elementary idea of their characteristics, use and starting. Simple connection diagrams. Calculation of power and current transmission and distributions.

Definition of feeder, distributors, and service mains, maximum demand, demand factor, load factor. Calculation of voltage in lines. Simple distribution circuits, Protection of overhead lines and electricity rules.

General : Definitions and laws regarding illumination. Simple calculations on illumination, candle power and design. Different type of lamps. Elementary idea of rectification of alternating current. Protective devices, power factor correction (simple devices and calculations). Idea of tariff and electric power bill calculation. Idea and connection diagram of an individual form plant. House wiring testing and installation.

Measuring Instruments : Construction, principle and classification of ammeter and volt-meter, elementary idea, use, and connection diagram regarding Wattmeter, Watthourmeter, power factor meter, Ohmmeter or Megger, frequency meter synchroscope, Maximum demand meter and instrument transformers.

Practical : To find resistance, reactance, capacity and impedance insulation test. Installation and testing of wiring starting and testing of common types of D. C and A. C. generator and meters.

PRACTICAL COURSE

The scope of the practical course is indicated by the syllabus.

Books recommended :—

DAWES : A course in Electrical Engineering Vols. I & II (3rd. Ed.). McGraw-Hill Book Co. New York.

MAYCOCK : Alternating Current Work. Sir Isaac Pitman & Sons, London.

CLAYTON : Performance and Design of Direct Current Machines. Sir Isaac Pitman & Sons, London.

PANDALL : Elementary Electrical Engineering. Sir Isaac Pitman & Sons.

RAPSON : Experimental Electrical Engineering. Sir Isaac Pitman & Sons

MORECRAFT : Continuous and Alternating Current Machinery. John Wiley & Sons, New York.

LLOYD : Electrical Equipment. John Wiley & Sons, New York.

KEMP : Theory of Alternating Current Macmillan & Co., London.

The marks will be allotted as follows :—

	Marks
Paper I—Material of Construction and Strength of Materials	50
Paper II—Mechanics and Statics ..	40
Paper III—Agricultural Machinery ..	40
Agricultural Machinery Practical ..	40
Paper IV—Principles of Electrical Machinery	40
Practical Examination on Electrical Machinery	40

Farm Management, Soil and Water Conservation (including Surveying). Machine Design and Engineering Reports

1. *Farm Management.*

(a) Types of farming ; factors that determine types of farming ; distribution of major crops and livestock illustrating types followed in India.

(b) Measures of profits ; factors affecting profits ; prices, size of farm business rate of production of crops and ani-

mals ; management of labour ; calendar of operations ; cropping systems ; layout of the farm ; location of farm buildings ; efficiency in the use of farm equipment and draft power ; choice and management of livestock ; marketing methods.

- (c) Choosing and buying a farm : factors determining selection of farm, valuation of farm, capital and requirements.
- (d) Farm book-keeping and records : property accounting, financial accounting, enterprise accounting, cost accounting, budgeting.

PRACTICAL COURSE

The scope of the practical course is indicated by the syllabus.

Books recommended:—

HART, V. B., BOND, M. C. AND CUNNINGHAM, L. C. : Farm Management and Marketing McGraw-Hill Book Co., 1942.

FORSTER, G W. : Farm Organization and Management. Prentice Hall, 1941.

APP, F. AND WALLER, A G. : Farm Economics
B. ppincott Co., N. Y , 1938

ADAMS, R. L. : Farm Management. McGraw-Hill Book Co., 1921.

WARREN, G. F. : Farm Management. Macmillan, Rev., Ed., 1940.

HOPKINS, J. A. : Farm Records. Iowa State College, Press, 1942.

MITCHELL, D. R. : Farm Accounting, McGraw-Hill Book Co., 1942.

I. C. A. R. : Report on Cost of Production of Crops, Vol. III, 1939.

2. *Soil and Water Conservation, including Surveying.*

(a) *Trigonometry*—trigonometrical ratios ; easy trigonometrical identities and equations ; solution of triangles ; measurement of angles of elevation ; heights and distances ; equation of circle, hyperbola, and ellipse ; special problems ; trigonometry tables.

(b) *Surveying*—measurement of distance using 100-foot chain and Gunter's chain, range poles, and pins ; measuring lines one level and sloping ground ; method of carrying out chain survey ; station

points ; tie-lines, and check lines ; offsets ; running traverse ; ditch profile : traverse surveying with prismatic compass ; magnetic north and true north ; bearing and angles ; adjustment a prismatic compass ; object of levelling ; theory of levelling, care and adjustment of Dumpy and Wye levels ; practice reading target rod and stadia board ; bench mark ; datum ; differential levelling ; profile levelling ; running grade line ; method of designating cuts and fills ; contouring topographic surveying ; traversing horizontal and vertical angles, methods of plane tabling ; practice using sight rule ; field book, scale of plan ; keeping notes. and plotting.

- (c) *Hydraulics*—friction losses ; speed, head, and efficiency ; viscous flow ; critical velocity ; Bernoulli's theorem ; discharge from orifices ; flow through pipes ; flow over weirs ; measurement of water ; flow in open channels.
- (d) *Soil Conservation*—causes of erosion ; kinds of erosion ; effects of erosion ; prevention of erosion by cropping, contouring, cultural methods, and terracing ; building

and maintaining terraces and soil-saving structures.

- (e) *Irrigation*—Precipitation, runoff, and stream flow ; evaporation, absorption, and seepage ; alkali, drainage, and sedimentation ; quantity of water required ; flow and measurement of water in open channels ; sub-surface water sources and sewage for irrigation ; Distribution and application of water ; location and capacity of reservoirs ; earth and loose rock dams ; masonry dams ; waterways and outlets ; pump and pumping equipment for lifting water ; a simple treatment of the following subjects :—classes of irrigation works ; alignment, slope, and cross-section : headworks and diversion weirs ; sluice ways, regulators and escapes ; falls and drainage works.
- (f) *Drainage*—drainage properties of soil ; open ditch design ; location, construction, and maintenance ; explosives and their use in land clearing ; control of gullies ; subsurface drains ; design, location, and installation of tile drains special methods of drainage.

PRACTICAL COURSE.

The scope of the practical course is indicated by the syllabus.

Books recommended :—

AYRES : Soil Erosion and Its Control. McGraw-Hill Book Co.

RUSSELL : Text-Book of Hydraulics. Henry Holt & Co., New York.

AYRES AND SCOATES : Land Drainage and Reclamation. McGraw-Hill Book Co.

POWERS AND TEETER : Land Drainage. John Wiley & Sons.

RUSSELL : Text-Book on Hydraulics. Henry Holt & Co., New York.

WILSON : Irrigation Engineering. John Wiley & Sons.

FORTIER : Use of Water in Irrigation. McGraw-Hill Book Co.

ISRAELSEN : Irrigation Principles and Practices. John Wiley & Sons.

LEWITT : Hydraulics. Sir Isaac Pitman & Sons.

GIBSON : Hydraulics. Constable & Sons.

VAUGH : Agricultural Surveying. Allahabad
Agricultural Institute, Allahabad.

8. *Machine Design.*

- (a) *General*—procedure methods in machine design ; stresses and strains in machine parts ; materials used in construction of machine parts.
- (b) *Fastenings*—rivets, rivet hoes, and riveted joints ; bolts, nuts, and screws, welded joints ; keys, cotters, and pins.
- (c) *Power Transmission*—Belting and pulleys ; manila and wire rope transmission ; chains and sprockets ; friction, spur ; bevel, and screw gearing ; couplings and friction clutches ; brakes and shafting ; bearings.
- (d) *Machines*—design of simple tools and parts of plows and other agricultural machines.

Books recommended :—

UNWIN : Elements of Machine Design, Vols. I
and II. Longmans Green & Co.

LEUTWILLER : Elements of Machine Design.
McGraw-Hill Book Co.

BASU : Engineering Mechanics, Vols. I and II
Jadavpur College, Calcutta.

SPOONER : Machine Design Construction and
Drawing.

Low : Pocket Book for Mechanical Engineers.
Longmans Green & Co.

agricultural engineering subjects ; prepara-
tion of papers for popular and technical
magazines and bulletins ; method of pre-
paring reports for governmental and tech-
nical bodies.

Books recommended :—

PEARSON : The Principles of Composition. D.C.
Health & Co., Publishers, Boston.

DAVIS AND KEELON : Studies in English Com-
position. Allyn and Bacon, Boston.

The marks will be allotted as follows :—

	Marks
Paper I—Farm Management ..	50
Paper II—Irrigation and Drainage ..	50
Paper III—Hydraulics and Soil Conser- vation	60
Surveying Practical ..	40
Paper IV—Machine Design ..	50

Bachelor of Laws Examination

The following Text-books and Acts are recommended :—

(a) For the Previous Examination

(i) *Roman Law.*

(i) Hadley : Roman Law.

(ii) Sanders' Institute of Justinian.

() (a) *The Law of Contracts, except the Law of Partnership.*

(i) Anson : Contracts.

(ii) Pollock and Mulla : Indian Contract Act (IX of 1872) Students' Edition.

(b) *Sale of Goods Act. (Act III of 1930.)*

(iii) University Selection of Leading Cases.

iii) *The Law of Easements and Torts.*

(i) Either Pollock : Torts, or S. Rama Swamy Iyer's Law of Torts.

(ii) Mitra, U. N. : Lectures on Easements.

(iii) The Indian Easements Act (V of 1882.)

(iv) University Selection of Leading Cases.

(iv) *The Law of Evidence.*

(i) Ratan Lal : Law of Evidence.

(ii) Cockle's Cases.

(iii) University Selection of Leading Cases.

(v) *Criminal Law and Procedure.*

(i) Ratan Lal : Indian Penal Code, Student's edition.*

(ii) Code of Criminal Procedure.

(iii) Sabonadiere : Trial of Criminal Cases in India.

(iv) University Selection of Leading Cases.

(vi) *Constitutional Law.*

(i) Dicey : Law of Constitution.

(ii) Government of India Act, 1935, with all amendments.

(iii) Ilbert : Parliament (Home Univ. Lib.).

(iv) I. Eddy and Lauton on India's Constitutions.

or

N. C. Roy : Constitutional System of India.

or

Keith's : Constitutional History of India.

(v) C. T. Carr : On Delegated Legislation.

or

Dr. Robinson on Public Authorities and Legal Liabilities for consultation.

* Candidates will not be required to have a knowledge of the amount of punishment which can be inflicted for any offence.

(vii) *Hindu Law.*

(i) Mulla : *Hindu Law.*

(ii) Siromni : *Hindu Law*, 3rd Ed. Vol. I, Part II.

(iii) University Selection of Leading Cases.

(iv) Tewari L. R.: *Leading Cases on Hindu Law*, (1940).

(b) **For the Final Examination**

(i) *Civil Procedure including Principles of Pleading.*

The Code of Civil Procedure (omitting Appendices).

(i) Mulla : *Commentary on the Civil Procedure Code* (Students' Edition).

(ii) Walsh and Weir : *Pleading in India.*

(b) *Limitation.*

(iii) The Indian Limitation Act (omitting the Schedule).

(ii) *The Law relating to Land Tenures (Rent and Revenue).*

(i) U. P. Tenancy Act XVII of 1939.

(i i) Act III of 1901 (United Provinces).

(iii) Eaden Powell : *Short Account of the Land Revenue and its administration in British India.*

(iii) *The Law of Partnership and of Companies.*

(i) The Indian Companies Act, 1913.

(ii) Topham's Company Law, with latest amendments.

(iii) The Partnership Act (IX of 1923).

(iv) *Muhammadan Law.*

(i) Wilson : Digest of Anglo-Muhammadan Law. From the beginning of Part II to the end of the book.

(ii) Amir Ali : Student's Hand-Book of Muhammadan Law.

(iii) University Selection of Leading Cases

(v) *The Law relating to Transfer of Property, etc.*

(i) The Transfer of Property Act (IV of 1882).

(ii) Sir Lal Gopal Mukerji : Law of Transfer of Property.

(iii) Snell : Principles of Equity—Chapters relating to Mortgages, *i.e.*, Chapters 20, 21, 22, and 23 of the 20th edition.

(iv) University Selection of Leading Cases.

(vi) *Equity with special reference to Trust and Specific Relief.*

(i) The Indian Trusts Act (No. II of 1882).

(ii) The Specific Relief Act (No. I of 1877).

nell : Principles of Equity—the Chapters on the History and Maxims of Equity, on Equitable Estates. On Trusts, on Mistake, on Fraud ; Actual and Constructive, and on Specific Performance, *i.e.*, Chapters 1 to 10 inclusive and Chapters 29, 30, 31 and 36 of the 20th edition.

(iv) University Selection of Leading Cases.

(vii) *Jurisprudence.*

(i) Holland : Jurisprudence.

Book recommended for reference :—

Salmond : Jurisprudence.

(viii) *Public International Law.*

Lawrence's International Law.

Note—Every Act mentioned in the above list should be understood to mean the Act with all subsequent amendments thereof.

University Selection of Leading Cases

I.—CONTRACTS

Henthron *v.* Fraser (1892), 2 Ch. 27.

Carlill *v.* Smoke Ball Co. (1893). I.Q.B., 256.

Mohori Bibee *v.* Dharmodars Ghose, 30 I.A. 114 ;
I.L.R., 30 Calcutta, 539.

Lalman *v.* Gauri Dutt, II A L.J.R. 489.

Derry v. Peek, 14 A.C., 337 (Lord Herschell's Judgment).

Foster v. Mackinnen, L.R., 4 C.P., 704.

Jamal v. Moola Dawood & Sons, 43 I.A., 6 ; I.L.R., 43 Calcutta, 493.

Keighley Maxsted & Co. v. Durant, (1901) A.C. 240

Hadley v. Baxendale (1854) 9 Exch, 341.

Nordenfelt v. Maxim Nordenfelt 1894) A.C. 535.

Bell v. Lever Brothers, Ltd. (1932) A.C.P.

II.—TORTS AND EASEMENTS

1. *Scott v. Shephard*, 2 W. Blackstone, 892
96 English Reports, 525.

2. *Lloyd v. Grace Smith and Co.* (1912)
A. C. 716 (Lord Macnaghten's Judgment).

3. *H. Hulton and Co. v. Jones* (1910) A. C.
20.

4. *Abrath v. N. E. Ry. Co.*, 11 Q.B.D. 440
(Judgment of Bowen, L. J.)

5. *Butterfield v. Forrester*, 11 East, 60 ; 103
English Reports, 926.

6. *Davis v. Mann*, 10 M. and W., 546 ; 152
English Reports, 568.

7. *Lumley v. Gye*, 2 Ell. and B. 216 ; 118
English Reports, 749.

8. Rylands *v.* Fletcher, L. R., 1 Exch., 265.
9. Nichols *v.* Marsland, L. R. 2 Exch. Division, I.
10. Donoghue *v.* Stevenson, 1932 A. C. 562.
11. Grant *v.* Australian Knitting Co. 1936, A.C. 85.
12. Hollywood Silver Fox Farm Ltd. *v.* Emmett (1936) 2 K. B. 468.
13. Rose *v.* Fort (1937) A. C. 826.
14. Owens *v.* Liverpool Corporation. (1939) I. K. B. 394.
15. Crofter Handevonen Harris Tweed Company and others *v.* Keitch and another (1942) A. C. 435.

III.—EVIDENCE

- Legal Remembrancer *v.* Lalit Mohan Singh Roy,
I.L.R., 49 Calcutta, 167.
- Bela Rani *v.* Mahabir Singh, I.L.R., 34 Allahabad,
341.
- Balkishen Das *v.* Legge, I. L. R., 22 Allahabad,
149.
- Mohammad Sharif *v.* Bande Ali, I.L.R., 34 Allaha-
bad, 36.

IV.—CRIMINAL LAW

R. *v.* Govinda, I. L. R. 1 Bombay, 342.

Gauri Lal *v.* Queen-Empress, I. L. R., 16 Calcutta, 206.

In re Amrita Bazar Patrika Press, I.L.R., 47 Calcutta, 190.

Amrita Lal Hazra *v.* Emperor, I.L.R., 42 Cal., 957.

Q.-E. *v.* Moss, A.W.N., 1894, p. 23.

Mohd. Husain *v.* K.-E., 15 Oudh Cases, 321.

Tapti Prasad *v.* K.-E., 15 A.L.J. R., 590.

V.—CONSTITUTIONAL LAW

1. *In re*. C. P. and Berar Motor Spirits and Lubricants Acts 1939 (F. C. R. Vol. 1. 18).

2. R. Arlidge *v.* Local Government Board 1915. A. C. 120.

3. Attorney General *v.* De Keyzers, Royal Hotel, 1920. A. C. 508.

4. Marais *v.* General Officer Commanding (1902), A. C. 109.

5. C. P. Mathen *v.* District Magistrate of Trivandrum. 31. C. W. N. 593.

6. Emperor *v.* Hemendra Prasad Ghose (1939) 43 C. W. N. 950.

7. Keshab Talapade's Case 1943 A. I., R. F., C. I.

8. Eshughay Elecko *v.* Government of Nigera. (1931) A. C. 662.

9. Attorney General *v.* Wilt's United Dairies (1927) 37 T. L. R. 884.

10. Secretary of State for Home Affairs *v.* O'Brien (1923) L. C. 603.

11. Chester *v.* Bateson (1920) I. K. B. 829.

VI.—HINDU LAW

Rungama *v.* Atchama, 4 M.I.A., I : 18 English Reports 600.

Bhoobun Moyee *v.* Ram Kishore, 10 M.I.A., 279 : 19 English Reports, 934.

Amarendra Man Singh *v.* Sanatan Sahai (1937) I.L.R. All. 955 P.C.

Appoovier *v.* Rama Subba, 11 M.I.A., 75 ; 20 English Reports, 6.

Kawal Nain *v.* Budh Singh, 44 I. A., 159 ; I.L.R. 39 Allahabad, 469 (P.C.)

Brij Narain *v.* Mangla Prasad, 51 I.A , 139 ; I.L R., 46 Allahabad, 95.

Hannooman Prasad *v.* Munraj Koonwaree, 6 M.I.A. 393 ; 19 English Reports, 167.

Buddha *v.* Laltu, 42 I A 208 ; I.L.R., 47 Allahabad, 604.

Ram Chandra *v.* Vinayak, 41 I.A., 290 ; I.L.R. 42 Calcutta, 384.

Bhagwandin *v.* Myna Bai (1867) 11 M.I.A. 487.

Mohammad Hasan Khan *v.* Keshava Nandan Sahai (1937) I L.R. All. 655 P.C.

Ranga Sami *v.* Nachippa, 46 I.A., 72 ; I.L.R.. 42 Madras, 523.

Sheo Shankar *v.* Debi Sahai, 30 I.A., 202 ; I.L.R., 25 Allahabad, 468.

VII.—MUHAMMADAN LAW

Gobind Dayal *v.* Inayat Ullah, I.L.R. 7 Allahabad, 775.

Ranee Khajooroonnissa *v.* Musammat Raushan Jehan, 3 I.A., 291 : I.L.R., 2 Calcutta, 184.

Jafri Begam *v.* Amir Muhammad Khan, I.L.R., 7 Allahabad, 822.

Hassarat Bibee *v.* Golam Jafar (1898) C.W.N., 57.

Habib-ur-Rahman *v.* Altaf Ali, I.L.R., 48 Calcutta, 866 (P.C.)

Muhammad Junaid *v.* Aulia Bibi, I.L.R., 42 Allahabad, 497.

Fakhr-ud-din *v.* Kifayat-ul-lah (1910) 7 A.L.J.R. 1095.

VIII.—TRANSFER OF PROPERTY

Gokal Dass, etc., *v.* Puranmal, I.L.R. 10 Calcutta, 1035 (P. C.)

Smyth *v.* Toms, (1918) 1 Irish Reports, 338.

Kreglinger *v.* New Patagonia Meat Company (1914) A. C. 25 (Lord Haldane's Judgment).

Ramcoomar Rundoo *v.* McQueen, 11 Bengal L.R. 46 (P. C.)

Webb *v.* Macpherson, I.L.R., 31 Calcutta, 57 (P.C.)

Krishnabai *v.* Hari Gobind, I.L.R., 31 Bombay, 15.

Musahar Sahu *v.* Hakim Lal (1915) 43. Cal. 521 P. C.

IX.—EQUITY

1. Wilmott *v.* Barber, 15. Ch. Div., 96.

2. Gopinath *v.* Kunj Behari Lall, I. L. R. 34 Allahabad, 306.

3. Thorndike *v.* Hunt, 3 De G. and J., 563, 44 English Reports, 1386.

4. *Tee v. Veriis*, 2 K. and J., 357 ; 69 English Reports, 818.

5. *Mussoorie Bank v. Raynor*, I.L.R., 4 Allahabad 503, 7 A. C. 321.

6. *Cooper v. Phibbs*, L. R., 2 H. L., 149.

7. *Stapilton v. Stapilton*. (1739). 26 English Reports, p. 1.

8. *Huguenin v. Baseley* (1807) 14 Ves. 273. 33 English Reports, 526.

9. *Mayor, Aldermen and Burgesses of Wolverhampton (Corporation) v. Emmons*. (1901) I.K.B. 515.

Mayor, Aldermen and Burgesses of Wolverhampton (Corporation) v. Emmons (1901) I.K.B. 515.

X.—INTERNATIONAL LAW

1. *The Cristina* 54. T. L. R. 512.

2. *The Zamora* 1916 (2). A. C. 77.

3. *The Stigstad* 1919. A. C. 279.

4. *Chung Chi Chung v. The King*, 55. T. L. R. 184.

5. *Government of Republic of Spain v. S. S. Arantzazu Mendi*. 55. T. L. R. 454.

6. The Atlmark.

7. The Asma Maru.

COMPANY LAW AND PARTNERSHIP

1. Salmon *v.* Salmon and Co., Ltd. (1897)
A. C. 22.

2. Royal British Bank *v.* Turquand (1857)
6. E. B.

3. Ashbury Railway Carriage and Iron Co.
v. Richie (1857) L. R. 7. H. L. 671.

4. R. *v.* Kysant. 1932. I. K. B. 442.

5. Cox *v.* Hickman. (1860). 8. H. L. C. 268.

Master of Laws Examination

(See Ordinances in Chapter XXXVII-B, pp, 78—
81.)

The University does not prescribe any text-books for this Examination. Six subjects must be taken of which four are compulsory and candidates can take any two of the others.

COMPULSORY SUBJECTS

1. Jurisprudence and Principles of Legislation.

2. Constitutional Law British and Indian and

the Constitutions of the Dominions in the British Empire and cases relating thereto.

3. Equity.
4. Either Hindu or Mohammedan Law with the translation of the original texts and subsequent development of that law by decided cases and legislation.

OPTIONAL SUBJECTS

Any two of the following :—

1. Mohammedan or Hindu Law whichever is not taken as a Compulsory subject, studied as aforesaid.
2. Law of Contracts and Torts.
3. Transfer of Immovable Property and the Law of Real Property in England.
4. Roman Law with special reference to possession and contracts.
5. International Law Public.
6. International Law Private.

Both International Law Public and Private include knowledge of important decisions of international and municipal courts and the trend

of modern thought as discussed in the publications of International Jurists.

Doctor of Laws Examination

(See Ordinances in Chapter XXXVII-C, 81—82.)

There is no examination for this degree.

Candidates must have practised at the bar for at least five years after having either taken the degree of Master of Laws or passed the examination for Honours in law under the regulations in force on or before November 1, 1905, and must have written an essay approved by the Faculty of Law or by a Committee appointed by it. The essay must be on some subject connected with Law or Jurisprudence.

B. Com. Examination (Part I)

(Part I Examination is to be taken at the end of
First year)

- | | |
|---|------------|
| 1. (a) Commercial and Industrial
Organisation .. | .. 1 Paper |
| (b) Accountancy .. | .. 1 „ |
| (c) Commercial Law | .. 1 „ |

2. (a) Principles of Economics and
Elements of Currency and
Banking 1 Paper.
- (b) Economic Development of
Great Britain, U. S. A., and
U.S.S.R. 1 „

B. Com. Examination (Part II)

(Part II Examination is to be taken at the end of
Second year)

1. English—

General Section.

- (a) First Paper—Essay (same as for B.A.)
- (b) Second Paper—Modern Prose (same as
for B. A.).
- (c) *Via voce* on Commercial
Subjects of .. 100 Marks.
2. (a) Statistics 1 Paper.
- (b) Indian Trade, Industries
and Transport .. 1 „
- (c) Hindi, or Urdu or Eng-
lish composition in spe-
cial cases if permitted by

the Head of the Department 1 „

3. One of the following Groups :—2 Papers
- (a) Advanced Accountancy and Auditing.
 - (b) Money Banking and Foreign Exchange.
 - (c) Industrial and Commercial Law and Secretariat Work and Practice.
 - (d) Public Finance and Administration.
 - (e) Life Assurance and Property Insurance.
 - (f) Actuarial Science.
 - (g) Rural Economics and Co-operation.
 - (h) Salesmanship and Advertising.
 - (i) Inland and Foreign Trade.

N.B.—To pass, a candidate must obtain 33 per cent. in each subject or group of subjects, and also 40 per cent. in the aggregate. No students will be allowed to take an optional subject in which instruction is not provided.

Note :—Every student may be required to write papers or to take part in the debates and discussions on commercial subjects which may be held in the Department unless specially exempted by the Head of the Department.

1. (a) COMMERCIAL AND INDUSTRIAL ORGANISATION.

The nature, constitution and financing of individual entrepreneur organisation, partnership and joint stock company, and the study of each of these forms of organisation from social and economic point of view.

The nature, and importance of Memorandum of Association ; Articles of Association ; Prospectus ; Directors' Report. Meeting of Directors and Shareholders. Promotion of Joint Stock Companies and their control, Managing Agents.

Combinations of business organisation.—Trade and Industry Combination ; federation, partial and complete consolidation.

The organisation of Kartels and Trusts and their effects on labour, producer, consumer, the selling price and the internal organisation of the business units in the Trust organisation.

Organisation of retail houses ; wholesale concerns ; department stores and multiple shops.

The factory system.—The modern machine system and the effect of its introduction upon labour, production and the organisation of industry. The factory system and the cottage industry. Scientific organisation and management of modern factories. Different forms of wage system.

Books recommended :—

1. Haney : Business Organisation.
2. Davar : Business Organisation.
3. Taylor : Shop Management.
4. Taylor : Principles of Scientific Management.
5. Kimbal : Industrial Organisation.
6. Hobson : Evolution of Modern Capitalism.
7. Hirst : Story of the Trust.
8. Dutton : Business Organisation.
9. R. C. Chowdhury : Principles of Industrial Organization.

1. (b) ACCOUNTANCY

Mahajani System of Accounts.

Special Problems in Partnership Accounts.

Company Accounts, including Amalgamation, Absorption and Reconstruction.

Double Account System.

Bank Accounts.

Royalty Accounts, Hire-Purchase Agreement and Instalment System.

Departmental and Branch Accounts.

Depreciation, Reserves, and Sinking Fund
(Advanced).

Books recommended :—

Carter : Advanced Accounts.

Batliboi : Advanced Accounts.

Spicer and Pegler : Book-keeping and Accounts

Cropper, L. C. : Higher Book-keeping and
Accounts.

William Pickles : Accountancy.

1. (c) COMMERCIAL LAW

Elementary principles only restricted to Sections
1 to 30, 56, 65, 68, 70, 71, 72, 73, 74, 75, 76.

Sections. 148, 150, 151, 170.

Sections. 182 to 289, 201, 211 to 225.

(2) The Negotiable Instrument Act.

(3) *Sale of Goods Act*.—Act III of 1930.

(4) *Indian Partnership Act*, 1932.

(5) *Indian Company Law*.

(6) The Indian Contract Act.

Books recommended:—

Topham : Company Law.

Davar : Mercantile Law.

Stevens : Elements of Mercantile Law.

Banerji, A. K.: Indian Mercantile Law.

2. (a) PRINCIPLES OF ECONOMICS AND ELEMENTS
OF CURRENCY AND BANKING.

Introductory :—Nature and subject matter of economics. Scope and methodology of economics science.

Consumption :—Characteristics of human wants. Laws of Diminishing Utility and Equi-marginal Utility. Necessaries, Comforts and Luxuries. Standard of Living. Elasticity of wants. Consumers' Surplus.

Production :—Factors and Agents of Production. Characteristic functions of Land, Labour, Capital and Organisation. Problems of Land, Division of Labour and its efficiency. Malthusian and Optimum theories of population. Wealth goods, income and Capital. Conditions for the growth of Capital. Laws of Returns Influence of Machinery and inventions. Localization of Industries. Principle of Substitution.

Exchange :—Value under competitive conditions, Laws of Demand and Supply. Equilibrium of Utility and Cost at the margin. Market price and Normal price. Elasticity of the Demand and supply in relation to Value.

Types of Monopoly. Value under simple Monopoly.

Banking :—Place of Banks in the modern financial structure. Functions and economic significance of banks. Nature and functions of Commercial, Industrial, Land-mortgage, Co-operative and Savings banks.

The Indian banking System :—Reserve Bank, Imperial Bank of India, Commercial Banks and Exchange Banks. History, present position and future of Industrial banks, Land-mortgage banks and Co-operative banks. Indigenous banking in India. Problem of consolidation, co-ordination and expansion of the Indian banking system.

Distribution :—National Dividend, Marginal Productivity. Theory of Distribution. A brief study of Rent, Interest Wages and Profits.

Books Recommended :

MARSHALL : Principles of Economics. (Selected Chapters).

TAUSSIG : Principal of Economics.

THOMAS : Elements of Economic.

MOULTON : Financial Organisation.

PANANDIKAR : Indian Banking.

MAHOLTRA : Indian Currency system.

2. *(b) Economic Development of Great Britain, U.S.A., and Russia.*

1. Great Britain (after 1600)

A study of the British agricultural, industrial, and commercial organisation of the Middle Ages (including Manorial organisation, Gild system, the Domestic system and Hanseatic League).

Agricultural development of the country to the present day and the part played by the State.

Industrial Revolution; its economic effects. General industrial structure of the country including a study of the principal features of the development of coal, iron and steel and textile industries.

Industrial labour movement.

State's role in the industrial organisation of the country.

8. *Russia : (After 1917).*

General characteristics of the Soviet Economy, Revolution and its economic aspects.

Planned Economic Development in Russia under N. E. P. and various Five Years' Plans with special reference to agriculture, industries, labour, transport, commerce banking and currency.

Books recommended :—

OGG AND SHART : Economic Development of Modern Europe.

SOUTHGATE : English Economic History.

ARTHUR BIRNIE : An Economic History of Europe.

DUBEY, R. N. : Economic Development of England.

SAVKER : Modern Economic Development of Great Powers.

SRIVASTAVA, C.P. : Modern Economic Development (England).

FAULKNER : American Economic History.

BOGART : An Economic History of the United States.

LIPPINCOTT : Economic Development of the United States.

JENNINGS : A History of Economic progress in the United States.

MILLER : Economic Development of Russia.

Development of commerce upto the present day. A survey of the tariff history of the country.

Development of communications and transport, including development of road, rail and ocean transport. State policy with regard to transport development.

Post-war economic development of the country.

2. *U. S. A.* (after 1850)

Struggle for commercial and economic independence. Economic aspects of the Civil War. Its causes and effects.

Advent of the industrial development, and the part played by the State. Principal features of the labour movement.

Growth of population, the Westward Movement and its effect on the economic development of the country.

Development of agriculture and the part played by the State. A brief study of Tennessee Valley Authority.

Development of communications and transport. Development of Commerce. Tariff policy of the State.

Economic Depression and its effects on American Economy. The New Deal and after.

LEITES : Recent Economic Developments in Russia.

DOBB : Russian Economic Development since the Revolution.

BAYKOV : Economic Development of Russia.

B. Com. Examination (Part II)

English Literature

There will be two papers.

Paper I—An Essay on a subject of general interest (maximum marks 35) and questions on Unseen passages and Usage (maximum marks 15).

The following books are recommended :—

Westaway : The Writing of Clear English.

Treble and Vallins : The A B C of English Usage.

Dixon : Dictionary of English Idioms.

Fowler : The King's English (abridged edition).

Murison : English Composition (C. U. P.).

Mais : The Writing of English.

McMordie : English Idioms.

Dennison Ross : This English Language.
Paper II—Moder Prose.

Books Prescribed—Any *one* of the following books :—

Christopher Lloyd : Democracy and Its Rivals.

R. W. Jepson : A Book of Short Stories.

Wells, H. G. : A Short History of the World.

One-act plays, Vol. V. (Harray).

No contexts are to be asked. Only questions that can be answered directly from the book shall be set. (maximum marks 20).

Questions will also be set on Idiom and Usage (maximum marks 15).

N.B.—A journal of general reading for two years shall be kept by each student, and submitted periodically to his seminar teacher, who shall submit a report through the Head of the Department to the *viva voce* examiners.

Viva voce on commercial subjects—100 marks.

2. (a) STATISTICS.

Statistics :—Its nature and scope, its limitations. Its importance to manufacturers, business men, economists, scientists, statesmen and social reformers.

Collection of Data : Definition of the unit of investigation : direct and indirect personal investiga-

tion, the investigations on the basis of existing documents, errors in collections of statistics. Representative data. The Law of Statistical Regularity.

A detailed study of the methods of collecting data with special reference to population, foreign trade, inland trade, family budgets, and agricultural statistics.

Classification and Tabulation of Data:—Classification according to attributes and class intervals, single and manifold tabulation, precautions in tabulation.

Averages as types:—Arithmetic average. Weighted average. The median. Quartiles, Deciles. The mode. Geometric mean. Harmonic mean. Their relative importance and limitation.

Graphic and Diagrammatic Methods:—Bar diagrams, Surface diagrams. Pictogram, Histogram. Frequency polygens, Curves, Trend and Short period fluctuations, Periodicity.

Construction of simple diagrams, representing data from Indian industries, trade and commerce, vital statistics, etc.

Index Numbers:—Methods of construction, choice of base year, weighted index numbers, index numbers of Saurbeck, Department of Statistics

(Calcutta) and of the Department of Labour (Bombay).

Dispersion and Skewness :—Co-efficients of dispersion. Standard Deviation, Measures and Co-efficients of Skewness.

Correlation :—Simple method of finding correlation ; use of Karl Pearson's co-efficient of correlation. Direct and inverse correlation

Interpretation of Statistics :—Precautions in interpretation. Errors in interpretation.

Books recommended :—

Boddington, A. L. : Statistics and their Application to Commerce.

Secrist : Introduction to Statistical Methods.

Report of the Indian Economic Inquiry Committee, Vol. 1.

D. S. Dubey and S. L. Agarwal : Elementary Statistics (Third Edition).

Bowley—Robertson Committee Report.

M. K. Ghosh and S. C. Chaudhri : Statistics—Theory and Practice.

2. (b) INDIAN INDUSTRIES, TRADE AND TRANSPORT.
(I) Industries.

Evolution and the present position of the major Indian Industries after 1850, *viz.*, Cotton, Jute,

Iron and Steel and Sugar. Fiscal policy of the Government during this period.

The principal cottage industries of the country with special reference to the U. P. Their present position and future possibilities.

Agriculture—Its development, present position, shortcomings and remedies. State aid to agriculture.

(II) Trade.

(a) Brief history of the development, of India's trade with the world since 1850. The present position. The chief imports, their countries of origin. The importance of the Indian markets to those countries.

(b) The chief exports and their destination. Importance of India as a supplier of the various commodities in those markets.

(III) Transport.

(a) Railway Transport—Capital and Expenditure. Railway Charges. Classification. Extent of Railway Development. Growth of Indian Railways. Relation with the State. Controlling Organisation for Railways in India. Railway Finance. Advantages of Rail Transport.

(b) Growth of Motor Transport. History of Road-Development in India. Advantages of Road Transport and its Economic Sphere. Road Finance.

(c) Water Transport (outlines only). Nature and Extent of Inland Water Transport—Its advantages and limitations, Coastal Transport.

(d) Air Transport (outlines only). Growth of Air Transport Organisation. Future possibilities of Air Transport.

(e) Competition between different forms of Transport. Co-ordination of different forms of Transport.

Books recommended :—

Reports of the Indian Tariff Board on Cotton, Iron and Steel, and Sugar.

Indian Industrial Commission Report.

Fiscal Commission Report.

Review of the Trade of India (latest edition).

R. D. AGARWALA: Sugar Industry and Labour.

VAKIL AND BOSE: Growth of Trade and Industry in Modern India.

H. R. SONI: Industry and its Problem.

Indian Road Development Committee
Report.

SANYAL : Indian Railways.

K. G. FENELON : Railway Economics.

Acworth Committee Report.

Jute Enquiry Committee Report.

Wedgwood Committee Report.

Industries Reorganisation Committee Report
(U. P.).

M. K. GHOSH : Transport Development and
Co-ordination.

DR. L. C. JAIN : Indian Economy during
the War.

WADIA AND MERCHANT : Our Economic
Problem.

K. L. GOVIL : The Cotton Industry of
India.

3. One of the following sub-groups :—

(a) Advanced Accountancy and Auditing.

Paper I—Accountancy.

1. Elements of Cost Accounting :—Elements
of Cost—Stores Control and Record.—Labour
Control and Record—Analysis of and Accounting
for works and sales expenses—Different methods of

allocation of indirect expenses—Different systems of costing.

2. Income-tax Accounts (based on Indian Law).

3. Insurance Accounts.

4. Bankruptcy and Liquidation Accounts.

5. Criticism of Published Accounts.

Books recommended :—

BATLIBOI : Advanced Accounts.

SPICER AND PEGLER : Book-keeping and Accounts.

L. R. DICKSEE : Accounting.

CROPPER : Higher Book-keeping and Accounts.

CARTER : Advanced Accounts.

WILLIAM PICKLES : Accountancy.

GUPTA, R. R. : Published Accounts their construction and criticism.

Paper II—Auditing.

The Continuous and the Completed Audit; the Detection of Fraud, Technical Errors and Error-of Principle. First and Subsequent Audit. Verification of Cash, Securities, Stock Sheets and Wages Sheets; Special considerations in different classes of audit; Valuation of fixed and floating assets;

Forms of accounts and balance sheets ; Capital and Revenue items ; Auditors' certificate ; the liabilities of Auditors ; the conduct of investigations and the certifying of average profits.

Books recommended :—

1. SPICER AND PEGLAR : Practical Auditing.
2. DICKSEE : Auditing.
3. LANCASTER : Auditing.
4. BATLIBOI : Lectures on Auditing.
5. DE-PAULA : Auditing.
6. CUTFORTH : Audits.

3. (b) Money, Banking and Foreign Exchange.

Paper I.—The nature, functions and services of money, Classification of monetary systems. The Theory of Value of money. Benefits and dangers of paper money. Banking and currency theories of note issue. Regulation of paper money and metallic currency. Quantity of money required by a nation. The nature and functions of credit. Kinds and significance of credit and credit instruments.

Commercial Banking operations (Advanced Study) : Various forms of loans. Difference between loans and discounts, between deposits and rates. Reserve requirements. Centralised and

decentralised reserves. Elasticity of bank credit,—Mobility and expansion ; over-expansion and contraction. A comparative study of the banking systems of India, England and America (U. S. A.), Principles of Government regulations of banking Clearing House organisation in India, England and the United States of America. Commercial Banking and ebb and flow of business : Seasonal and cyclical variations in the demand for funds. Commercial Banking and business cycles. Bankers' investments. The development of branch banking.

The rôle of finance in modern economic organisation. The dominant position of the financier. Central Banks—The Central Bank as currency authority. Relations between the State and the Central Bank. Capital, distribution of profits, reserve fund and liquidation. Administration of Central Banks. Note issues and note and banking reserves. Relation between the Central Bank, commercial banks and the money market dealings in gold and foreign exchange ; discount, loans and other business Co-operation between Central Banks.

Administration and operations of Reserve Bank of India and Imperial Bank of India.

Price—The price level. Index number. Causes in the changes of price level. Inflation and deflation. Changes in the price level in England and

in India from 1860. Probable causes. The economic and social effects of rising and falling prices. Their effects on the trading and agricultural classes in India. Business cycles.

Books recommended :—

DIWEY AND SHUGRUE : Banking and Credit.

MOULTON : Financial Organisation.

AGGER : Organised Banking.

KEMMERER : A. B. C. of Federal Reserve System.

SYKES : Present Position of English Joint-Stock Banking.

SYKES : Amalgamation Movement in British Banking.

SAYER : Modern Banking.

TRUPTIL : British Banks.

KISCH AND ELKIN : Central Banks.

MURANJAN : Modern in India.

Paper II—Foreign Exchange.

The basis of foreign exchange. The mechanism and methods of international payments. Functions of foreign exchange banker. Types of bills of exchange. Pars of exchange. The Mint pars and gold specie points in Theory and Practice. Purchasing Power Parity. Analysis of the causes

of the fluctuations in the foreign exchanges. The different kinds or bills of exchange. Price relationship of the different kinds of bills of exchange. Foreign exchange quotations. The influence of money rates on the exchange market. Banker's long Bills. Import and export credits and the financing of foreign trade with special reference to India, England and U. S. A. Arbitrage. The silver exchange. Dislocation of exchanges. The problem of stabilisation. How to read the foreign exchange articles.

The Law and Practice of Banking—Functions and duties of the different officers of a bank. Opening of account and the payment of cash against cheques. Banker's advances against produce and securities. Practical operations in connection with endorsements, payments of cheques, crossed cheques and collection of cheques. Laws relating to Bills of Exchange and Promissory Notes.

Books recommended :—

ESHER : Foreign Exchange Explained.

SPALDING : Foreign Exchange and Foreign Bills.

EVITT : Practice of Foreign Exchange.

AIYER Foreign Exchange in India.

SHELDON : Practice and Law of Banking.

TANNAN : Banking Law and Practice in India

SYKES : Outline of English Banking Administration.

THOMAS : Banker and Customer.

3. (c) Industrial and Commercial Law and Secretariat Work and Practice.

Paper I—The procedure and administration of companies registered under the Companies' Act from their promotion to their dissolution with special attention to the work of the Secretary and the practice involved. Business management and office organisation. Division of responsibility. General system of control and internal check. Responsibilities and duties of the officers of a company. Procedure at meetings and the law relating thereto. Accounts. Costing. Income-Tax practice.

Paper II—*Industrial and Commercial Law.*

(a) General principles of the law of employers and workmen. Factory law. Workmen's Compensation and employer's liability. Trade Unions.

(b) Law relating to Income-tax. Elements of the Law of Mortgages, Provisions of the Stamp Act relating to commercial documents.

- (c) Laws relating to Insolvency; Arbitration; Fire and Marine Insurance; Patents and Trade Marks.

Books recommended :—

Chartered Institute of Secretaries' Manual.

LAFFINGWELL, W. H. : Scientific Management.

RUSTAMJI : Company Law.

DAS-GUPTA, B. N. : A Treatise on Income-Tax Law, and Account.

GUPTA, R. R. : Income Tax.

Indian Acts on Insolvency, Arbitration, Patents and Designs, Factories, Workmen's Compensation. Trade Unions, Income-tax, Stamps and Transfer of Property (Sections on mortgages only).

3. (d) PUBLIC FINANCE AND ADMINISTRATION.

Paper I—Administration in India.

The Central Government.

The Provincial Government.

The Indian States.

The Position of India in the Commonwealth.

The Legislatures.

The Judiciary.

The Relations of the Provinces to the Central Government.

The Services.

The Army and Defence.

The Police.

Education.

Sanitation. Public Health.

Local Self-Government, District Boards, Municipalities and Panchayats. (With special reference to the administration of local civil services).

Paper II—Public Finance with special reference to India.

Scope—Relation between private and public economy.

Expenditure.—Primary and secondary functions. Normal and abnormal, productive and unproductive. Principles of Division of duties between different Governments. Industrial undertakings Relation to scope of state activities and to distribution of wealth. Canons of Expenditure.

Revenue—Sources of Revenue—Tax and non-tax. Various kinds of taxes. Canons of taxation and their application to India. Construction of the tax system. Division of resources between different Governments. Shifting and incidence. Reaction on production and distribution of wealth and other effects. The tax burden.

Debt—Public and Private credit—Funded and unfunded, short and long term. Treasury bills. Relative merits of taxes and loans. Purposes of raising loans and their payment, public debt of India. The burden of debt.

Practical problems in connection with the raising of revenue ; assessment, collections and evasion. Income-tax Offices. Land revenue settlement and administration. Customs and excise administration.

Income-tax Accounts. Land Revenue Accounts. Excise Accounts. Customs Accounts.

Municipal tax administration. House taxes, water rates, octrois, and other important taxes.

Books prescribed:—

HOGAN, A. E.: The Government of Great Britain.

KALE : Indian Administration.

SHIRBAS : Science of Public Finance.

VAKIL, C. N. : Financial Development in Modern India.

Reforms Enquiry Committee Report.

Report of the Taxation Enquiry Committee.

Books recommended :—

LOWELL, A. L. : Government of England.

MUKERJI, P. : Indian Constitution.

GYAN CHAND : The Financial System of India.

SELIGMAN : Essays of Taxation.

Budget for the current year.

Civil Estimates of the Province.

3. (e) LIFE ASSURANCE AND PROPERTY INSURANCE.

Paper I—*Principles of Insurance and Life Insurance.*

Principles of Insurance—Meaning, definition and essentials of insurance. The origin of insurance. 'Insurance' and 'Assurance.' Life, fire, marine and other types of insurance. Various types of insurance organisations like stock companies, mutual associations, Lloyds Associations, and their comparative advantages and disadvantages. The essentials of an insurance contract. Subrogation, double insurance and re-insurance. Advantages of insurance.

Life Insurance—Essential of a life insurance contract. Assessmentism and modern life insurance. Importance and economic implications of life insurance. Protection and investment features of modern life insurance.

Life Insurance Policies—With profit and without-profit policies. Whole life and endowment policies. Policies on 5% Debenture plan, instalment plan, etc. Policies with premiums payable in a single instalment in a fixed term of years, in reduced amounts for first few years and till the termination of the policy. Term insurance, decreasing term insurance, double endowment and pure endowment insurance policies. The scope of each type of insurance policy. A brief discussion of the new types of insurance policies.

Annuities—Difference between annuity and life insurance. Immediate and deferred and male and female life annuities, etc. The scope and sphere of usefulness of annuities.

Life Insurance Funds—Origin of funds. Funds in relation to insurance premium plans. Technical necessity of the fund. Public demand in relation to insurance fund. The fund technique. Insurance funds in India.

Life Insurance Investments—The investment of insurance fund. Canons of insurance investment. The problem of liquidity in insurance investments. Investment policy in India. Investment policies in United Kingdom, United States of America, etc. Reforms in the investment policy followed in India.

Mortality Tables—The basic theory of life insurance. The importance of mortality statistics and their prognostic value. Mortality tables and their construction. Effect of selection on mortality. The problem of rating up and rejection. Select mortality rates. Select and ultimate mortality rates.

Premium Rates—Net and Gross premiums. The elements of gross premium. The calculation of a single premium rate with the help of given data. Bonus loading, especially in with and without-profit policies in relation to bonuses.

Profits of Insurance Companies—Valuation and its implications. Profits and surplus. Calculation of surplus and profit. Sources of profit. Distribution of bonuses. Kinds of bonuses.

Policy Conditions—Policy conditions as given in a policy and their legal implications.

A short review of the chief provisions of the *Indian Insurance Act*.

Books recommended :—

1. LEIGH : A Guide to Life Assurance.
2. MITRA : A Guide to Life Assurance.
3. AGARWALA, A. N. : Insurance Finance.

4. AGARWALA, A. N. : Business Methods and Machinery, Vol. II (Chs. XII to XVI).
5. RIEGEL AND LOMAN : Insurance Principles and Practices.
6. DAWSON : Elements of Insurance.
7. HUEBNER : Life Insurance.
8. MACLEAN : Life Insurance.
9. M. K. GHOSH AND A. N. AGARWALA : Insurance Principles, Practice and Legislation.

Paper II—*Fire and Marine Insurance.*

Fire Insurance—Necessity and functions of fire insurance. Nature of insurance risk and its comparative aspect. Principle of indemnity and other leading principles. The study of the Standard Policy. Kinds of fire policies. The settlement of claim. More than one policy, more than one fire, term of fire policies, tariff and non-tariff offices and other miscellaneous matters. Re-insurance and Retention. Average and Co-insurance.

Marine Insurance—The value of marine insurance to international commerce. Conception of indemnity and its comparative aspect. Essentials of a marine insurance contract. Warranties and P. P. I

Form and phraseology of a marine policy. Total and partial losses. General average, particular average, particular charges, and salvage charges. Preparation of Average Statements. Calculation and returnability of premiums, Bottomry and Respondentia.

Books recommended :—

1. E. BROOKE : Fire Insurance.
 2. MITRA : Marine, Fire and Accident Insurance.
 3. GODWIN : Fire Insurance.
 4. RIEGEL AND LOMAN : Insurance Principles and Practices.
 5. KEATE : Marine Insurance.
 6. HUEBNER : Property Insurance.
3. (g) Rural Economics and Co-operation.

Paper I—*Rural Economics*.

Principles of Rural Economics. Economics characteristics of agriculture. Existing conditions of Land, Labour, Capital and Organisation in Indian Agriculture. Land Tenures, Agricultural Improvement. Rural Development—Village Industries. Common life. Encouragement of Village Panchayat. District Boards—Functions and Finance. Their place in Rural Development.

Books recommended :—

DARLING : The Punjab Peasant in Prosperity and Debt.

NOURSE : Agricultural Economics.

MUKERJI : Foundations of Indian Economics.

BADEN POWELL : Land Revenue System of British India.

ROWARD : Crop Production in India.

MUKERJI, R. K. : Rural Economy in India.

CARVER : Principles of Rural Economics.

LEAKE : Basis of Agricultural practice.

VENN : The Foundation of Agricultural Economics.

JACK : Economic Life of a Bengal District.

SLATER : Some South Indian Villages.

MANN AND MANITKAR : Land and Labour in a Deccan Village.

CALVERT : Wealth and Welfare of the Punjab.

AMBEDKAR : The Evolution of Provincial Finance in India (Selected Chapters).

JEVONS, H. S. : Economics of Tenancy Law and Estate Management (Bulletin No. 17, Economics Depart, Allahabad University).

DUBEY, D. S. : The Way to Agricultural Progress. U. P. District Board's Act.

Final Report of Agricultural Tribunal of Investigation.

Government Resolution on Land Revenue Policy in India, 1902.

The Report of the Taxation Enquiry Committee (Selected Chapters).

The Report of the Agricultural Commission.

MARSHALL : Economics of Industry.

THOMAS : Elements of Economics.

JATHER AND BERI : Indian Economics, Vols. I and II (Selected Chapters).

Report of the Indian Taxation Inquiry Committee (Selected Chapters).

Paper II—*Co-operation* :—The evolution of co-operative movement abroad and in India.

Co-operative Organisation in Europe. U.S.A., Japan and India.

Various forms of co-operative activities in Foreign Countries and India and their degree of success.

Avenues of further co-operative progress in India.

Books recommended :—

FAY, C. P. : Co-operation at Home and Abroad.

MOLYOAKE, G. J. : History of Co-operation.

HENRY WOLF : People's Bank.

K. OGATA : Co-operative Movement in Japan.

Co-operative Movement in U. S. A.

Co-operative Movement in Ireland.

CALVERT : The Law and Principles of Co-operation.

The Report of the Maclagan Committee on Indian, Co-operation.

DARLING, E. L. : European Co-operation.

WOLF, H. : Co-operation in India.

BHATNAGAR, B. G. : Co-operative Organisation in India.

MATHAI, JOHN : Agricultural Co-operation.

3. (b) Salesmanship and Advertising.

Paper I—*Salesmanship*.

1. Preparation of the sales campaign.
2. Contact with the customer.
3. Maintaining relations with the Customer.
4. The cultivation of character in the salesman.
5. Organization of the Sales Department of large factory.

Paper II—*Advertising*

1. General Principles and Methods.
2. Science and Art in Advertising.
3. Who pays the cost?
4. Misleading Advertising.
5. Efficient Advertising.
6. The Advertising Man.
7. The Psychology of the buyer.
8. The need of research.
9. Present-day Mediums.
10. Mediums of the Future.

11. Agents.
12. Newspaper Advertising.
13. Supplementary aids to newspaper advertising.
14. Schemes and selling plans.
15. Advertising special sales.
16. Advertising of specific lines.
17. Mail order Advertising.
18. General Advertising.
19. The Technical.
20. Miscellaneous.

Books recommended :—

The Science and Art of Salemanship *by* SIMON RUPORT HOOVER.

Fundamentals of salesmanship *by* MORRIS A. BRISCO.

Practical Salemanships *by* NATHANIEL C. FOWLER.

The Social and Economic Problem *by* GEORGE FRENCH.

How to advertise a Retail Store *by* ALBERT E. EDGER.

Psychology of Advertising *by* DR. SCOTT.

KLIPPER : Advertising.

3. (i) Inland and Foreign Trade.

Organization of internal and foreign trade. Functions of middlemen. Chambers of Commerce, Consular Service, Indent Business. Tariffs, Financing of internal and external trade of the country. Extent of the inter-provincial, coastal, and Foreign Trade.

Paper I—India and United Kingdom.

Paper II—Germany, U. S. A., and Japan.

Books recommended :—

League of Nations : Review of World Trade.

League of Nations : Statistical Year Book.

Review of Trade of India.

M. Com. Examination (Previous)

The Examination for the Degree of M. Com. shall comprise two parts :—

M. Com. Previous—A written examination in four selected subjects, and *viva voce*.

M. Com. Final—A thesis or a dissertation on a problem relating to Indian Commerce, In-

dustries, Finance or Transport or a written examination in four selected subjects other than those taken up in M. Com. Previous Examination from the list of subjects specified for the purpose. There will also be a *viva voce* on General Commercial Knowledge.

- (i) Each student be required to submit and pass in one essay approved by the Head of the Department of Commerce and prepared during the two years as a condition precedent to his being sent up for the final examination unless he can satisfy the Head of the Department of his having written articles or taken adequate part in the debates and discussions in any of the Associations of the Department; the essays and the article to become the property of the University.
- (ii) Each student may also be required to taken training for at least two hours every work during term-time in any industry which may be specified by the Department.

(1) *M. Com. Previous—Written Examination.*

The written examination shall comprise four papers of three hours each. The candidates may

offer any four of the following subjects on each of which one paper will be set :—

1. The Organisation of Industries in India.
2. Corporation Finance.
3. The Organisation of Markets.
4. International Banking and Foreign Exchange.
5. International Trade and Fiscal Policy.
5. Transport.
7. Advanced Insurance.
8. Economics of Agriculture with special reference to India (Rural Economics).
9. Co-operation.
10. Advanced Business Economics.
11. Theory and Practice of Statistics.
12. Economic Activities of the State.
13. Labour and Urban Problems.
14. Public Economics.
15. Monetary Theory and Practice.
16. Social Security.

(2) *M. Com. Final Examination—The Thesis or Written Examination.*

Every candidate for the M. Com. Final Examination shall submit along with his application three printed or type-written copies of a thesis on some problem concerning Indian Commerce, Finance, Transport or Insurance or any other allied subject approved by the Committee of Courses and Studies in Commerce* and shall in foot notes or preface quote precise references to published works or reports on which he has relied for his facts and figures or appear in the written examination as provided previously. Every candidate will also have to appear in a *viva voce*.

* The candidate must select the subject for his thesis within three months of his admission to the M. Com. Previous class in consultation with the Head of the Department for the sanction of the same by the Committee of Courses and Studies of Commerce in time.

The thesis must be submitted to the Registrar before March 1, every year.

N.B.—No student will be allowed to take up a subject in which instruction is not provided. No student will also be allowed to take a subject in which he specialised in the B.Com. Final Examination.

M. Com. Examination, Previous

Each paper—100 marks	{	Minimum Pass 36 per cent. of the aggregate marks in the Previous Examination.
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Viva voce—100 marks.

M. Com. Examination, Final—Thesis or Written Examination

Thesis

External Examiner—200 marks	{	Minimum Pass Marks 36 per cent of the aggregate marks.
Internal Examiner—200 marks		
<i>Viva voce</i> on General Commercial Knowledge—100 marks.		

Written Examination

Each paper—100 marks	{	Minimum pass Marks 36 per cent of the aggregate marks.
<i>Viva voce</i> on General Commercial Knowledge—100 marks.		

Note—Marks of the two examinations, Previous and Final, will be added to determine the position on the Pass List of the Final Year.

1st Class—60 per cent and over.

2nd Class—48 per cent and over.

The Organisation of Industries in India

A detailed study of the organisation, finance and management of the leading industries of India, viz., Cotton, Jute, Iron and Steel, Sugar, Cement, Paper and Pulp, Match, Coal, Glass and Heavy Chemicals.

The Managing Agency System—Its advantages and defects.

The Basis of Modern Industry : Resources—Natural and Human.

Capital.

Labour Legislation and Organisation.

Welfare Work.

Combination Movement in the Indian Industry.

State in relation to Industry.

The Tariffs.

Books recommended :—

GADGIL : Industrial Evolution of India.

SONI, H. R. : Indian Industry and its Problems.

VERA ANSTEY : Economic Development of India.

KNOWLES : Economic Development of British Overseas Empire. Part 1, (Portions dealing with India).

PILLAI : Economic Conditions in India.

JATHAR AND BERI : Indian Economics.

BASU : Industrial Finance in India.

DEY, H. L. : The Indian Tariff Problem in relation to Industry and Taxation.

BUCHANAN : The Development of Capitalistic Enterprise in India.

CLOW, A. G. : The State and Industry.

LOKANATHAN : Industrial Organization in India.

LOKANTHAN : Industrial Welfare in India.

COYAJEE : India's Fiscal Policy.

Various Acts on Labour Legislation in India.

Reports of the Fiscal Commission, Labour Commission, and Industrial Commission.

Reports of the Tariff Board on the various industries prescribed in the course.

K. P. KHARA : Industrial Protection of India.

N. G. SHAH : History of Indian Tariffs.

Bengal Jute Enquiry Committees' Reports (1934, 1939).

M. P. GANDHI : Sugar Industry. Its Past, Present and Future.

M. P. GANDHI : Sugar Annuals.

Indian Sugar Manual by Sugar Technologists' Association of India, Cawnpore.

Indian Central Jute Enquiry Committee's Reports.

WADIA AND MERCHANT : Our Economic Problems.

M. P. GANDHI : Problems of Sugar Industries in India.

K. L. GOVIL : The Cotton Industry of India.

Report on the Location of Industry in India.

Corporation Finance.

Financial needs of modern industries. Financial institutions, their types, functions and relations to other businesses. The promotion of companies and the raising of long-term capital. Economic function of the Promoter. Various steps in company promotion, such as investigation, determination of the scope of the enterprise, estimation of capital costs and possible return on investment. Relation of different classes of investors. Underwriting and marketing industrial securities. Supply of short-term capital ; bank advances ; bills

of exchange : documentary credits ; the money market ; the foreign exchange market. Capitalisation of an enterprise. Evils of excessive capitalisation and under capitalisation. Watered Capital.

Amortization and refunding of corporate debt—special circumstances calling for amortization Methods of amortization. The role of Managing Agents in the promotion, organisation, financing and management of Joint-Stock companies in India.

Books recommended :—

LYALL : Corporation Finance.

MEAD : Corporation Finance.

FIELD : Corporation Finance.

DEWEY : Corporation Finance.

NASH : Investment Banking in England.

CHOWDHURY : Principles of Industrial Organisation.

SAMANT AND MULKY : Organisation and Finance of Industries in India.

GERSTENBERG : Financial Organisation and Management.

DAS, N. : Banking and Industrial Finance.

ROBINSON : Investment Trust Organisation and Management.

GRAYSON : Investment Trusts.

COOPER : Financing and Enterprise.

GERSTENBERG : Materials of Corporation Finance.

The Organisation of Markets

Significance of a knowledge of marketing—Evolution of marketing organisation and practice—conditions prior to the Industrial Revolution ; modern industrial and commercial developments ; changes in marketing organisations and methods.

The characteristics of the market—Meaning of the term market ; a perfect market ; an organised market ; different concepts of the market (place, organisation, price making) ; classification of buyers and sellers ; classification of goods ; factors that control a market ; importance of co-ordinating production with demand.

Marketing functions—The marketing process, concentration and dispersion ; buying, selling, transportation, storage, grading, finance and risk-bearing functions.

Methods of wholesale distribution and operating problems of wholesalers. Organised wholesale markets.

Methods of retail distribution and operating problems of retailers : multiple shop system ; departmental stores ; co-operative stores, etc.

Methods of mail order business.

Methods of sales promotion—Brands and Trade Marks : Personal Selling ; Press and other forms of advertising.

Marketing of agricultural products with special reference to (U. P. Cotton, Wheat, Jute, Rice, Seeds, etc.,) Co-operative marketing of Agricultural products in India.

Marketing of industrial goods.

Marketing of shares and Securities.

Financing marketing activities.

Market risks and hedging.

Regulation of markets.

Government marketing Organisation : Trade Commissioners. Marketing Officers and their establishments.

Market surveys in U. P. may be taken up in any term if it is convenient to the Department.

Books recommended :—

1. CLARK, F. E. : Principles of Marketing.
2. WHITE AND HAYWARD : Marketing Practice.

3. SIMMAT : Principles and Practice of Marketing.
4. THOMAS RUSSELL : Commercial Advertising.
5. E. DAVIES : The Money, and the Stock and share Markets.
6. MARSHALL : Industry and Trade (Selected Chapters only.)
7. MARSHALL : Readings in Industrial Society (chapters on marketing only)
8. Report of the Agricultural Commission (relevant portions only).
9. Report of the Central Banking Enquiry Committee (relevant portions only).
10. Report of the Provincial Banking Enquiry Committees (relevant portions only).
11. Report of the Jute Enquiry Committees (relevant portions only).
12. Report of the Indian Central Cotton Committee.
13. Reports of the Government of India on Marketing Surveys issued by the Marketing Officer.
14. HUSSAIN : Agricultural Marketing in Northern India.

15. Reports of the Indian Central Jute Enquiry Committee.
16. K. L. GOVIL : Marketing in India.
17. Report on the Co-operative Marketing of Agricultural produce in India.
18. Report on Fairs, Markets and Produce Exchanges in India.

International Banking and Foreign Exchange

Banking organisation including theory and practice of Central Banking in India. England, U. S. A., Germany and Japan. A critical study of Indian banking problems and London Discount Market.

Stock Exchange.—A critical and comparative study of the operation in the Stock Exchange in London, New York, Bombay and Calcutta.

Foreign Exchange.—Importance of Foreign Exchange in modern economic development. The mechanism and methods of international payments. Causes of the fluctuations in the foreign exchanges. Different kinds of bills of exchange and their price relationship. Forward exchange. Foreign exchange quotation.

Banker's Long Bills. Financing of foreign trade in India, England and U. S. A. Dislocation of exchanges. Arbitrage operations. The Purchasing Power Parity, Exchange Stabilization and Exchange Control.

Books Recommended :—

WILLS : Foreign Banking Systems.

VERA C. SMITH : The Rational of Central Banking.

KISCH AND ELKIN : Central Bank.

BASTOR : The International Banks.

ESCHAR : Foreign Exchange Explained.

SPALDING : Foreign Exchange and Foreign Bills.

EINIGY : The Theory of forward Exchange.

GREEN GRASS : Discount Market in London.

MADDEN AND NEDLER : International Money Markets.

NORTHROP : Control Policies of the Riechabank.

HOLLAND : Law and Practice of the Stock Exchange.

GREGORY : British Banking Statutes and Reports.

SAYERS : Bank of England 1890-1914.

SYKES : Present Position of English joint Stock Banking.

SYKES : Amalgamation Movement in British Banking.

Reports of the Cunliffe and MacMillan Committees.

AIYES : Foreign Exchange in India.

TRUPTIL : British Banks.

MURANJAN : Modern Banking in India.

SAYER : Modern Banking.

DOCKER : Foreign Exchange.

GHOSH, B. S. : An Introduction to Banking Principles, Practice and law.

DADACHANDJI : A Reserve Bank for India and the Money Market.

DAS, N. : Banking and Industrial Finance.

CROSS : Domestic and Foreign Exchange.

EVITT : Practice of Foreign Exchange.

DEWEY AND SLUGRAN : Banking and Credit.

AGGER : Organised Banking.

International Trade and Fiscal Policy.

The distinguishing features of international transactions. The study of international trade as a special aspect of trade in general ; comparison with interregional trade. The international division of labour. The theory of comparative costs. Recent criticisms and elaborations of the classical doctrine. The gain from foreign trade. The barter terms of trade.

International payments in relation to monetary systems. The theory of international prices. The Theory of Purchasing Power Parity. The Balance of payments theory of foreign exchanges. The mechanism of foreign exchanges. Bills of exchange letters of credit, and other media of international payments. Long and short-exchanges. Forward exchanges. The place of gold in the international monetary systems. The future of gold, National monetary autonomy. Exchange control. Exchange equalisation funds. Council Bills and Reverse Council Bills. India's Foreign Exchange.

International capital movements. Equilibrium and disequilibrium in the balance of payments. Favourable and unfavourable balance of trade. Relation between balance of payments, and interest rates and prices. Classification of transactions and their mutual inter-dependence. The foreign trade

and balance of payments of India. Statistics relating to India's foreign trade. Home charges.

The theory of fiscal policy. Free Trade *versus* Protection. Bilateralism. Recent developments in international trade and fiscal policy in the world. The changing trend of trade. Trade of the industrial and agricultural countries. Tariffs and Quotas. The technique of tariff-making. Most-favoured-nation clause. India's fiscal policy. Discriminating Protection. Ottawa Trade Agreement and the Indo-Japanese Agreements.

Books recommended :—

BASTABLE : International Trade.

P. B. WHALE : International Trade (Home University Series).

TAUSSIG : International Trade.

HARROD : International Economics (Cambridge Economic Handbooks).

OHLIN : International and Interregional Trade.

HARTLEY WITHERS : International Finance.

VINER : Canada's Balance of Payments.

VINER : Studies in the Theory of International Trade.

PAUL EINZIG : The Theory of Forward Exchanges.

League of Nations' *Balances of Payments*.

IVERSEN : International Capital Movements.

WRIGHT : Exchange Equalisation Account.

League of Nations' *Exchange Control*.

World Economic Survey (several years).

COYAJI : India's Fiscal Policy.

H. L. DEY : Indian Tariff Problem.

Review of India's Trade (several years).

Transport

1. Railway Transport—(a) Capital and Expenditure. Combinations. Rates and Fares. Classification of goods and minerals. Discrimination and undue preference. State Regulation of rates and fares. State ownership and management.

(b) Divisional *versus* Departmental organisation. Passenger and Goods stations working. Rolling Stock Distribution. Marshalling Yards. Wagon pooling.

2 *Indian Railways*—Development. Relation to the State. Management. Railway Finance. Relation to one another. Internal administration and executive organisation. Changes suggested by the Acworth Committee.

3. *Road Transport*—Economics of road construction and maintenance. Theories of rates and fares. Types of road transport. Relation to the State. Relation of road to railway transport. Roads and road transport as means of opening up undeveloped and outlying tracts.

4. *Sea Transport*—Outline of its development. Organisation of ocean transport services. Economics of marine transport. Rates and fares. Competition and monopoly. Rate and traffic agreements. Pools and Conferences. Shipping rings. The Deferred Rebate System and the Rate War. Government aid and regulation of Ocean Transportation. Ports, their functions and dues. Influence of the Great War on shipping. Indian Mercantile Marine. The Indian Navy.

5. *Air Transport*—Modern Developments. Commercial possibilities of Air Transport. International Air Navigation. Commercial Organisation of Air Services. State *versus* Private Operation. Basic Principles of and Economic Factors in the operation of services. Ground Organisation. Traffic Control. Passenger, Freight and Mails. Present development of air transport in India.

6. Competition between Different Forms of Transport. Co-ordination of Different Forms of Transport.

Books recommended :—

1. M. K. GHOSH : Transport Development and Co-ordination.
2. K. G. FENELON : Railway Economics.
3. RIPLEY : Railroad Problems.
4. RIPLEY : Railroad—Finance and Organisation.
5. SHERRINGTON : Economics of Rail Transport in Great Britain.
6. SRINIVASAN : Indian Railway Freight Rates.
7. SANYAL : Indian Railways.
8. MEHTA : Indian Railways Rates and Regulation.
9. S. C. GHOSE : Indian Railway Economics Parts I and III.
10. K. G. FENELON : The Economics of Road Transport.
11. Stephenson's Communications.
12. HAJI : Economics of Shipping.
13. Acworth Committee Report.
14. Mitchell-Kirkness Committee Report.
15. Wedgwood Committee Report.

Advance Insurance (M. Com.)

General Principles of Insurance—Insurance as an economic device of risk-bearing and risk distribution. Sociological value of insurance. Origin of insurance. A brief history of the forms assumed by insurance and their nature. Legal essentials of insurance contracts.

Life Insurance—Essentials of a life insurance contract. Theory of life insurance in the light of the theory of probabilities and the law of statistical regularity. Mortality tables and premium rates. Valuation, surplus and bonus. Annuities.

Marine Insurance—Marine insurance in relation to international commerce. Conception of indemnity in marine and fire insurance. Essentials of a marine contract. Warranties and the status of P. P. I. The form and phraseology of a marine policy. Total and partial marine losses, including the preparation of simple average statements. Particular and salvage charges. Calculation and returnability of premiums. Bottomry and Respondentia.

Fire Insurance—Functions of fire insurance. Physical and moral hazards. Principle of indemnity and its growing infringement. Essentials of fire

insurance contract. Kinds and terms of fire policies. Average in fire insurance classification and rating of risk. Co-insurance, re-insurance and retention.

Insurance Finance—The conception and scope of insurance finance. Terminological tussle regarding 'fund', and 'reserve.' Origin and necessity of the fund. The fund technique. Accumulation of fund by life and non-life offices. Investment of funds. Canons of investment. Funds and investment policies in India. A critical study in the light of the investment policies in U. S. A., U. K. and other important countries of the world. Reforms in the Indian investment policy.

State and Insurance—The problem of state ownership, control and regulation of insurance, with special reference to India. A general study of the Indian Insurance Act, 1938.

Insurance in India—Present position of life, fire and marine insurance in India. Postal insurance in India. Social insurance in India. Health insurance in India. Leading problems of Indian insurance.

Books recommended :—

ADARKAR, B. P. : Report on Health Insurance for Industrial Workers.

AGARWALA, A. N. : Adarkar Plan of Health Insurance : Will It Work ?

AGARWALA, A. N. : Social Insurance Planning in India.

BEVERIDGE : Report on Social Insurance and Allied Services.

I. L. O. : Social Security Principles.

WILLCOT : Economic Theory of Risk and Insurance.

HUEBNER : Life Insurance.

MACLEAN : Life Insurance.

NATHAN WILLET : Principles and Practice of Life Insurance.

MAGEE : Life Insurance.

LEIGH : A Guide to Life Assurance.

RIEGER AND LOMAN : Insurance Principles and Practices.

MITRA : A Guide to Life Assurance.

ZARTMAN : Yale Readings in Insurance.

YOUNG : Insurance.

GEPHART : Principles of Insurance.

AGARWALA, A. N. : Business Methods and Machinery, Vol. II, (Ch. 12-16).

TEMPLEMAN AND GREENACRE : Marine Insurance, Principles and Practices.

KEATE : Marine Insurance.

DOVER : A Handbook of Marine Insurance.

MITRA : Guide to Marine, Fire and Accident Insurance.

HUEBNER : Property Insurance.

COLE :—Of Fire Insurance.

E. BROOKE : Fire Insurance.

KITCHEN : The Principles and Practice of Fire Insurance.

AGARWALA, A. N. : Insurance Finance.

RAYNES : Insurance Funds and Their Investment.

Indian Insurance Act, 1938.

Indian Insurance Year Books (Recent Issues).

M. K. GHOSH AND A. N. AGARWALA : Insurance Principles, Practice and Legislation.

Rural Economics

Land Tenures.—Agricultural Improvements. Irrigation and Communications. The Importance and possibilities of village industries. District

Board Finance, Contrast between Rural and Municipal Problems.

Books recommended :—

1. DARLING : The Punjab Peasant in Prosperity and Debt.
2. JAFRI : History and Status of Landlords and Tenants in the United Provinces.
3. MUKERJI, R. K. : Foundations of Indian Economics.
4. BADEN POWELL : Land Revenue Systems of British India.
5. HOWARD : Crop Production in India.
6. CARVER : Principles of Rural Economics.
7. VENN : Foundations of Agricultural Economics.
8. HEILPERIN : International Monetary Economics.
9. HOLMES : Economics of Farm Organisation and Management.
10. NOURSE : American Agriculture and the European Market.
11. PUCK : Chinese Farm Economy.
12. KAJI : Co-operation in India.

13. WOLFF : Co-operation in India.
14. LEAKE : Foundations of Agriculture in India.
15. BHATNAGAR : Co-operative Organisation in British India.
16. JEVONS, H. S. : Economics of Tenancy Law and Estate Management (Bulletin No. 17, Economics Department, Allahabad University).
17. DUBEY, D. S. : The Way to Agricultural Progress.
18. U. P. District Boards Act.
19. Final Report of Agricultural Tribunal of Investigation.
20. Government Resolution on Land Revenue Policy in India.
21. The Report of the Taxation Enquiry Committee (selected chapters).
22. Report of the Royal Commission on Agriculture in India.
23. Report of the U. P. Banking Enquiry Committee (selected chapters).
24. SELIGMAN : Economics of Farm Relief.

Co-operation

Co-operation as a principle. Its application to modern business life. Its genesis and development in Europe and the Far East. Its working in America. This part is to cover all the European countries about which literature is available such as Germany, Italy, Russia, France, Denmark and England. Also Japan, China and America.

Co-operation in India. Its evolution and history. Co-operative Law in the various Provinces. Various forms of co-operative activity—their constitution and working principles.

Various forms of co-operative activity. Degree of success achieved in the various Provinces.

Organisation for propaganda and control. Co-operative Finance and Accounting. Co-ordinating and higher agencies in the Co-operative Movement. Criticism of the existing things, and lines of further developments.

Books recommended :—

- 1, WOLFF : Peoples Banks.
2. FAY, C. R. : Co-operation at Home and Abroad.
3. CALVERT, H. : Law and Principles of Co-operation in India.

4. HOUGH, E. M. : The Co-operative Movement in India.
5. KAJI, H. L. : Co-operation in India.
6. BHATNAGAR, B. G. : Co-operative Organisation in British India.
7. KIYESHI, OGATA : The Co-operative Movement in Japan.
8. TUCKER, D. S. : Evolution of Peoples Bank in China.
9. BARAU, N. : Russian Co-operative Banking.
10. JEVONS, H. S. : Co-operative Common Wealth.
11. MUKERJI, B. B. : Co-operative Rural Welfare.

Advanced Business Economics

Nature and Subject matter of Economics.—Classical and modern views on the subject—Robbin's contribution and its critical estimate—Economics as a positive science, normative science, applied science and art—Problems of economic terminology and Ideology—The case for the reconstruction of economic science—Relation of Economics to business—The scope of Business Economics.

Some Problems of Production.—Laws of Returns and their casual and effectual significance—Theories of Population Malthusian Theory, Optimum Theory and Biological Theory and their critical estimate.

Theory of Perfect Competition.—Perfect and Imperfect markets—Determination of Value under Perfect Competition—Market Value and Normal Value—Real Cost and Money Cost—Opportunity Cost—Marshall's Representative firm and Pigou's Equilibrium firm and their implications in the Theory of Value.

Theory of Imperfect Competition.

Theory of Monopoly.—Definition of monopoly—theory of monopoly price—Limits of monopolist's power—Kinds of monopoly.

Business Cycles.—Meaning and measurement of business cycles—Theories of Business Cycle, Old and New—The problem of a unified theory of Business Cycles.

Economic Welfare and National Dividend:—Relation between National Dividend and economic welfare—National Dividend and the Quality of the people, Inequality

of incomes—Its causes and effects—Its remedies—Transference of Wealth from the rich to the poor.

Economics of Socialism.—Definition and tenets of Socialism—An analysis of Capitalism—A critical evaluation of the Capitalistic System. Picture of the Socialistic State—Tactics of Socialism—Socialism and Gandhism.

Economic Planning with special reference to India.—Definition, aims and technique of economic planning—Freedom under planning—Public Corporations as instruments of economic development; their origin, structure and future; typical cases of Public Corporations in the world. A critical estimate of the recent plans for economic development of India—Political, economic, statistical, religious, social, psychological and other pre requisites of economic planning in this country. A critique of the recent economic planning deliberations in this country—future of Planning in India.

Books Recommended :—

MARSHALL : Principles of Economics (Selected Chapters).

PIGOU : Economics of Welfare (Selected Chapters).

ROBBINS : Nature and Significance of Economic Science.

AGARWALA, A. N. : Reconstruction of Economic Science.

WRIGHT : Population.

CARR-SAUNDERS : Population.

CANNAN : Review of Economic Doctrines.

MEADE : Economic Analysis and Policy.

J. ROBINSON : Economics of Imperfect Competition (Selected Chapters).

F. A. G. ROBINSON : Monopoly.

HABARLER : Prosperity and Depression.

MITCHELL : Business Cycles.

DALTON : Inequality of Income.

AGARWALA, A. N. : Socialism without Prejudice

PIGOU : Socialism and Capitalism.

GYAN CHAND AND OTHERS : Public Corporation.

BARBARA WOOTON : Freedom under Planning.

AGARWALA, A. N. : Pessimism in Planning.

AGARWALA, A. N. : A Critique of Industrialist's Plan.

Recent Economic Plans Published in India.

Theory and Practice of Statistics

(1) Collection, Classification, Tabulation, Presentation, Comparison and Interpretation of Statistical data.

Correlation, Logarithmic Curves and Curves representing the law of diminishing returns, etc., based on statistics. Association and contingency. Graphic Algebraic and other methods of interpolation and extrapolation. Forecasting of fluctuations of economic phenomena. Methods of Measuring and forecasting of population growth. Accuracy and sampling. Significance of observed differences between averages.

(2) Collection of data (official and private) and actual construction of tables, diagrams, etc., based on those data regarding any one of the following: Wages, Prices, Population, Family Budgets, Marketing Surveys.

(3) Importance of Statistics in India. Availability and adequacy of statistics in India. Need for more intensive and extensive investigation in India.

Books recommended :—

SECRIST : Introduction to Statistical Methods.

BAYLISS : A Course in Business Statistics.

RIGGLEMAN AND FRISBEE : Business Statistics.

BOWLEY : Elements of Statistics.

DUBEY AND AGARWALA : Elements of Statistics.

CONNOR : Statistics in Theory and Practice.

Census Reports.

Statistical Abstract for British India.

Review of Trade of India.

Bowley-Robertson Committee Report.

Indian Economic Enquiry Committee Report.

Wheat Marketing Survey.

M. K. GHOSH AND S. C. CHAUDHRY : Statistics—Theory and Practice.

Economic Activities of the State

Principles of state participation in economic enterprise. *Laissez fair*, state control, and nationalization.

Social Insurance, Workmen's compensation, old age, invalidity and maternity benefits.

Unemployment. Brief study of causes and remedies and state assistance as specially applicable to India

Factory legislation. Mines, Shipping, Machinery, Inspection.

Regulation of production ; adulteration of food and drink, ghee, milk, etc., drugs and narcotics,

excise and opium policy and state control and regulation. Pharmaceutical education and compilation of Indian pharmacopia.

Government regulation of prices and monopolies, normal and abnormal. War, famine and other calamities, Regulation of produce exchanges, grading, prevention of speculation,—cotton, wheat, etc.

State aid to industries—study of methods. State control of public works and public utility services; roads and bridges, railways, posts, telegraph, telephone, and broadcasting services, aviation. Agencies of control.

State control of criminal tribes. Economic and educational aspects of jail confinement. Assistance to discharged prisoners. The State and public health. Sanitation. Prevention of epidemics and endemic diseases.

The State and the control of prostitution and the white slave traffic with special reference to industrial and port towns.

The League of Nations. The Health Committee.

The State and public research and information.

Direct participation and other methods of assistance.

N.B.—The paper will be studied with special reference to India. Reference to foreign countries will be only incidental.

Books recommended :—

HAROLD LASKI : Grammar of Politics (Specified Chapters).

H. T. HADLEY : The Economic Problems of Democracy.

A. C. PIGOU : Economics of Welfare (Specified Chapters).

GILBERT SLATER : Poverty and the State.

J. M. KEYNES : End of Laissez-Faire.

H. A. SILVERMAN : Economics of Social Problems.

J. C. KYDD : Indian Workman's Compensation Act.

A. C. CLOW : Indian Workman's Compensation Act.

The U. P. Unemployment Committee Report of 1935.

H. R. SEAGER : Social Insurance.

A. C. PIGOU : Industrial Fluctuations (Specified Chapters).

SIR W. M. BEVERIDGE : Unemployment.

W. PATON : Opium in India. .

Indian Factory Acts. Mining Acts, Annual Reports on Factory and Compensation Acts. Maternity Benefit Acts, Provincial and Indian States Committees' Reports on Unemployment : Government of India Central Board of Revenue Memorandum on the Alcohol Question, 1925 ; Indian Excise Committee Report, 1905-06 ; U. P. Excise Report, 1921. Criminal Tribes Settlement Reports, etc. Appropriate publications of the League of Nations and the Indian Labour Organisation.

State and other publications will be indicated as the course proceeds during the session.

Labour and Urban Problems

British Labour Movement—History up to the present time. Trade Unions, structure, functions and Government. Industrial peace, conciliation and arbitration. Education and Research Department. International connections.

Indian Labour—Village background, connection and influence. Recruitment, conditions, security,

promotion. Hours, Wages, Minimum wages, Child labour.

Labour of Women—Trade Unions : Characteristics, history, future Industrial peace, works committee, machinery for conciliation and arbitration Health, diet, maternity benefits, industrial diseases. Town-planning, housing, village-settlements. Building regulations and sanitation. Education, general and technical agencies. Welfare work, recreation, civic amenities agencies. Debts, cooperative credit and distributive stores.

Life of labouring classes in typical Indian industries ; cotton, jute, coal, metallurgical, mining, shipping, railways, plantations, seasonal industries.

Labour and the constitution, central, provincial and municipal.

Labour research and statistical bureaus.

International Labour Organisation—Pre-war history. Constitution, organisation, and functions. Achievements. Prospects.

Books recommended:—

1. WEBB : Industrial Democracy.
2. COLE, G. D. H. : History of the British Working Class Movement, Vols. I, II and III.

3. COLE, G. D. H. : The World of Labour.
4. CUNNISON, J. : Labour Organisation.
5. SHIELDS, B. F. : The Evolution of Industrial Organisation.
6. BROUGHTON, G. M. : Labour in Indian Industries.
7. MATHESON, C. : Indian Industry.
8. BURNETT-HURST : Labour and Housing in Bombay.
9. MUKHTAR, A. : Factory Labour in India.
10. GUPTA, R. B. : Labour and Housing in India.
11. HOBSON, J. A. : Conditions of Industrial Peace.
12. RICHARDSON, J. H. : The Minimum Wage.
13. KELLY, F. T. : Welfare Work in Industry,
14. MAYERS, C. S. : Industrial Psychology in Great Britain.
15. LOKANATHAN, P. S. : Industrial Welfare in India.
16. LANCASTER, H. V. : The Art of Town-Planning.

17. NETTELEFORD, S : Practical Housing.
18. PILLAI, P. P. : India and the International Labour Organisation.
19. I. L. O. PUBLICATION : The International Labour Organisation. The First Decade.
20. Report of the Royal Commission on Indian Labour, 1931.
21. Report of the Bombay Strike Enquiry Committee, 1928-29.
22. Report of the Court of Enquiry on Railways, 1932.

Public Economics

General :—Meaning and Scope ; Science and Art. Aspects : Relations to Economics and Politics : Private and Public Economy ; Characteristics of Public Authority ; Maximum Social Advantage.

Public Expenditure :—Classification ; Canons of Expenditure ; Relation of Expenditure to State Activities and to Distribution of Wealth ; Division of Expenditure between Central, Provincial and Local Governments in India ; Critical study of principal heads of Expenditure such as National Defence, Law and Order, Education, Agriculture and Industries.

Public Revenue :— Sources of Revenue ; Classification ; Canons of Taxation ; Shifting and Incidence ; Reaction on production and distribution of wealth and other effects ; Indian Taxation System ; Division of resources between Central, Provincial and Local Governments in India ; Critical study of the principal heads of Revenue, such as, income-tax Land-revenue, customs and excise.

Public Debt :— Public and Private credit ; objects of public borrowings ; different types ; Relative merits of taxes and loans ; Public Debt of India ; Rupee and Sterling Loans ; Provision for Redemption ; Conversion ; Reparation.

Administration (a) Financial : The necessity of Budget ; Framing of Estimates ; Voting of demand for grants.

(b) General : The Central Government : The Provincial Government : Local Self-Government—District Boards and Municipalities : Inadequacy of Provincial and local finance under Provincial autonomy : Legislatures.

Books recommended :—

1. SHIRRAS : Science of Public Finance.
2. DALTON : Public Finance.

3. VAKIL, C. N. : Financial Development in Modern India.
4. MISRA, B. R. : Public Finance under Provincial Autonomy.
5. GYAN CHAND : Financial Administration in British India.
6. ADARKAR : Principles and Problems of Federal Finance.
7. WATTAL : Systems of Financial Administration in India.
8. SHAH, K. T. : Constitution, Functions and Finance of Indian Municipalities.
9. METHA, J. K. : Nature and Classification of Public Revenue and Expenditure.
10. Budget for the current year.

MONETARY THEORY AND PRACTICE.

Theories of Value of Money.—Quantity Theory.
Cambridge Theory and Keynesian theories.

Gold-Price Relationship.—Recent Theories specially Professor Cassel's Theory and Professor Rist's Theory.

Interest-Price Relationship.—Keynes' theory
—Fisher's Real Rate Cassel's True Rate

—Wicksell's Normal Rate—Hayek's Equilibrium Rate—Sraffa's Commodities Rate.

Balance of Payments.—Fundamental concepts—Classification of transactions resulting in International Payments—Analysis of International transactions—Interdependence within the Balance of Payments.

Theories of Foreign Exchange.—Balance of Payment Theory—Purchasing Power of Money Theory. Psychological Theory.

MONETARY PARTIES.

Equilibrium in International payments.—Long-run Equilibrium—Adjustment in Fixed Parties—Exchange. Fluctuation as instrument of re-equilibrium.

Some Currency Systems and Monetary Internationalism.—International Gold Standard—Exchange standard. Gold Exchange Standard—Free Paper Currencies.

International Monetary Problems—International Monetary Co-operation—International Monetary Fund, Bank and Currency Plans.

Monetary Standards.—Externals standards, e.g., Gold Standard, Gold Exchange Standard, Bimetallism, etc. International Barter. Internal standards, e.g., Cost-price, Equilibrium, Full Employment, etc.

SOCIAL SECURITY

(With special reference to India)

Evolution and Institutional growth of Social Security. Meaning of Social Security. Social Security. Social Insurance and Social Assistance. Limitations of Social Security.

Scope of Social Insurance. Contingencies covered. Persons covered. Benefit Rates and Contribution Conditions. Financing of Social Insurance, and Distribution of Costs. Administrative Structure of Social Insurance System.

Scope of Social Assistance. Important Forms of Social Assistance like Maintenance of Children, Maintenance of Invalids and Aged. Mothers' Pensions, Unemployment Assistance, Medical Assistance, Rehabilitation of Disabled. General Assistance.

A detailed study of Medical care Service, Nature and Form of Medical Care Service. Per-

sons covered. The Provision of Care and its Co-ordination with General Health Services. Quality of Service. Financing of Medical Care Service. Administration of Medical Care Services.

Social Insurance Systems in United Kindgdom, United States of America, Australia and U.S.S.R.

Medical Care Planning in various countries of the world. History of Sccial Socurity in India. Recommendations of the various official committees in this respect from time to time (from Bombay Strike Enquiry Committee to Adarkar Report and Labour Investigation Committee.)

Present Position of Social Insurance and Labour Welfare in India, and proposals for future planning. Accident and Maternity Insurance in India. A critical study of Maternity Benefit Legislation and Workmen's Compensation Legislation. Sickness, Unemployment and Pension Insurance in India. The Problem of the Scope of Social Insurance in India. Nature and pattern of Evolution of the Social Insurance System in India. The Problem of Social Insurance Finance in India. Actuarial and Administrative Structure of Social Insurance Organisation in India. Objections and fears in India.

A detailed study of the Health Insurance Movement in India. Early schemes of Health Insurance. Adarkar Scheme of Health Insurance. Scope of Health Insurance. Financial, Statistical and Machinery and Medical Organisation under the Scheme. Health Insurance and National Health Drive. Health Insurance and the State. Stack and Rao Proposals and their critical examination.

Public Health in India. Health Administration in India. Medical Relief and Preventive Health Work in the Provinces. The Nutrition of the People. Health Services for Mothers and Children. Health Services for school children. Environmental Hygiene. Vital Statistics. Medical Education and Research.

Future of Social Security in India. Social Security and Economic Planning.

Books Recommended :

I. L. O. : Social Security Principles.

I. L. O. : Approaches to Social Security.

I. L. O. : General Problems of Social Insurance.

I. L. O. : The Investment of the Funds of Social Insurance.

I. L. O. : Industrial Labour in India.

A. N. AGARWALA : Social Insurance Planning in India.

A. N. AGARWALA : Health Insurance in India.

A. N. AGARWALA : Problems of Social Security for Industrial workers.

B. P. ADARKAR : Report on Health Insurance.

B. P. ADARKAR : Social Security Planning in India.

COHEN : Social Insurance Unified.

ROBSON : Social Security.

CLOW : Workmen's Compensation in India.

PILLAI : Maternity Benefit in India.

Books for Reference :

I. L. O. : International Labour Code.

I. L. O. : International Survey of Social Services.

Reports of the various Committees including Royal Commission on Labour, Labour Investigation Committee, etc.

BEVRIDGE : Social Insurance and Allied Services (Report).

Examination in French, German
and Italian

For a Certificate of Proficiency

FRENCH

A. Books prescribed for detailed study :—

1. First Year French for Adults, by H. D. Hargreaves, Harop.
2. Second Year French for Adults, by H. D. Hargreaves, Harop.
3. French Comprehension Texts (Reader, by F. C. Roe Nelson.

B. Book recommended for general reading :
Mademoiselle Perle and other Tales, by Mau-
passant Bilingual Series.

GERMAN

A. Books prescribed for detailed study :

1. Sieppmann's German Primary Course, MacMillan.
2. A Progressive German Reader, by A. H. Winter Pitman.

B. Book recommended for general reading :
Neue Jugend, and other tales, by M. L. Barker
and F. Wolken, Helfer, Cambridge.

If not available :

Grimms Marchen. ed. Hirsch, Blackie.
Italian

Prescribed Books :—

1. Grandgent, Italian Grammar (Heath and Co.).
2. Grillo, Selections from the Italian Prose Writers (Blackie):

Pages : 21-24 : Boccaccio. Ghino di Tacco e l'Abate di Cligny.

Page 71-76 : Machiavelli, Lettera al Vettori and In che modo i principi devano osservare la fede.

Pages 182-184 : Galilei, Che la natura produce i suoi effetti con grande verietà di maniere.

Pages 243—246 : Alfieri, Sviluppo dell'indole indicato da pari fatterelli.

„ 318-342 : Manzoni, La ribellions. L'arresto e la fuga di Renzo, L'Innominato, Don Rodrigo al castello del l'Innominato, Lucia al castello de l'Innominato.

„ 369-373 : Pellico, Schiller.

„ 395-401 : Leopardi, Pensieri.

Pages 503-508 : De Sanctis, I personaggi dei Promessi Sposi.

„ 542-546 : Carducci, Le risorse di San Miniato.

„ 598-602 : D'Annunzio, Il buon frateilo and La Passeggiata.

Recommended Books ;

Goldoni, La locandiera, ed, by Geddes and Tosselyn (Harrap).

Or

Fucini, Novelle and Poesie (Harrap).

**Examination in Military Science
For a Certificate of Proficiency
Military Science**

The examination in Military Science will comprise two papers and a practical examination. Candidates must obtain the minimum pass marks in the practical examination and in the total of the papers as well as in the aggregate.

The following syllabus is prescribed :—

PAPER I—Elementary Military Organisation and administration, including the principle of War

in History (N. B.) characteristics in fighting troops ; Cavalry, Infantry, Artillery, Aircraft and Tanks and Armoured Cars, Organisation of Fighting troops ; Information, Grounds and Formations. Composition of orders. Field Works.

N.B.—Candidates will be expected to be acquainted with military history of one of the campaigns to be announced beforehand.

Paper II—Elementary Military Law including Indian Army Act, I. T. F. Act, Duties of Company Commander, Platoon Commander. Section Leader ; Courts Martial ; Organisation of U.T.C. Organisation of the Urban Unit of I.T.F., Rules and Regulations under I.T.F. Act.

- (a) Map reading conventional signs, Contours and Co-ordinates.
- (b) Musketry : Care of Arms ; Firing positions ; Fire orders.
- (c) Ability to instruct a squad in squad drill, Arms drill and Musketry.
- (d) Ability to command a platoon in Company drill and in Field operations. Attack, defence, out-posts Advance and Rear Guards.

Marks will be allotted as follows :—

MARKS

1st Paper	.. 50	} Minimum pass marks	36
2nd Paper	.. 50		
Practical	.. 50	Minimum pass marks	18
<hr/>			
Total	.. 150	Minimum pass marks	54

**The Examination for a diploma in
Indian Music**

The following syllabus is prescribed for the examination of 1950 for *Junior Diploma* in Indian Music.

Vocal Music

Theory—Samgita, Nāda, Svara, Suddha and Vikṛta, Saptaka, Thāta, Rāga, Alamkāra, Āsrayarāga, Vakra svara, Pakada, Mātrā, Tāla, Odava, Sādava, Sampurna, Purvarāga, Vilambita, Madhya and Druta, Uttarakāga, Sandhi-Prakāśā-rāga, Gunadosa of the Musician, Suddha, Chhāyā-laga, and Sankirna rāgas, Graha Amsa, Nyāsa, Vādi, Samvādi, Anuvādi Vivādi, Ālāpa, Tāna, Bolatāna, Dhruvāpada, Khyāla, Tappā, Thumari, Tarrānā, Chaturanga.

A short history of North Indian Music. Reading and writing of Music in simple notation.

Practical—Bilāwala, Yamana, Khamāja, Bhairava, Kāfi, Āsāvāri, Bhairavi, Bhupālī, Kedāra, Bihāga. Desa, Tilak-Kāmoda, Purvi, Maravā, Todi, Vāgisvari, Bhimapaḷāsi, Vindāvani Sāranga. Pilu, Mālakosa, Durgā, One Saragama, Lakṣanagita or Ālāpa and one classical song in each rāga. The students must have a knowledge of the following Tālas:

Tritāla, Ekatāla, Jhapatāla, Dādarā, Chautāla, Kaharavā, Dipachandi, Dhammāra and Tivra (Teora), Jhumarā.

Instrumental Music

Theory—Some as for vocal music, and a knowledge of the following :—

Gat ; Jhālā, Zamazamā, mind suta, ghasita, todā, parana, bole, tuning of the instruments, etc.

Practice—Students will be required to possess a general knowledge of the rāgas prescribed for vocal music, but special attention will be paid to the rāgas mentioned below. Students will be required to know the system of tuning

the instruments and how to effect simple repairs, the name of the important types of musical instruments in India, and the *easy saragams* and *gats* in the following *rāgas*.—

- | | |
|---------------|------------------|
| 1. Bhimpalāsi | 7. Desa |
| 2. Bhupāli | 8. Tilaka-Kāmoda |
| 3. Bhairava | 9. Vāgisvari |
| 4. Bhairavi | 10. Āsāvāri |
| 5. Kāfi | 11. Kānādā |
| 6. Bihāga | 12. Pilu |

One of the following instruments can be offered for examination.

Sitāra ; Esrāja ; Harmonium ; Flute ; Violin ;
Tabalā or Pakhawāja.

In Tabalā or Pakhawāja, the knowledge of the following Tālas with Thekas and easy Parans will be required :—

- | | |
|------------------------|------------------|
| 1. Tin Tāla or Tritāla | 7. Dhammāra |
| 2. Kaharavā | 8. Dipachandi |
| 3. Ekatāla | 9. Tivrā (Teora) |
| 4. Jhapatāla | 10. Sulphāktāla |
| 5. Chautāla | 11. Jhumarā |
| 6. Dādarā | 12. Āda chowtāla |

The following syllabus is prescribed in vocal and instrumental music for the examination of 1950, for a *Senior Diploma* in Indian Music.

Vocal Music

Theory : Srutis, and Svarastkānas of the past and present systems of South and North : Gita ; Gāndharva Gāna ; Desi Sangita ; Nibaddha-Anibaddha Gāna ; Rāgālāpa ; Rāgalaksana, Bahutva, Alpatva, Rupakālāpa, Ālapti : Āvirbhāva, triobhāva sthāyi, svasthāna, Mukhchālana, Āksipti, Prachalitālāpa, Tāna, Dhrupad ; Khyāla ; Kappa, Thumari, Hori, Ghazal, Tarrānā ; Chaturanga ; Styles of Singing ; Vaggyeyakāra ; difference between South and North Tāla Paddhati ; Sangita Granthas.

Elementary theory of Western Music and Western notation.

Practical—One slow Khyāla and one fast Khyāla, should be taught in each of the following Rāgas :—

Suddha Kalyāna, Kāmod, Chhāyānata, Gaud Sārang, Hindol, Sankarā, Deskāra, Jaijainanti, Rāmākali, Puriya-Dhanāsri, Vasanta, Paraja, Puriyā, Lalita, Gaudmalāra, Miyānmalāra, Bahar Adānā Darbari, Jaunpuri, Sri Sohani, Kalingadā, Kanada and Multani.

Tālas—Tritāla, Ekatāla, Jhapatāla, Chautāla, Kaharava, Āda-chautāla ; Rupaka ; Punjābi Thekā ; Tilawadā ; 1 ādāra ; Sulaphāka-tāla ; Tivīā ; Jhumarā.

7. At least five Dhrupads and three Dhamars shall be taught out of the Rāgas prescribed in any one of the Rāgas mentioned above.

Instrumental Music

Theory.—Same as for vocal music.

Practice.—Students will be required to possess a general knowledge of the Rāgas prescribed for vocal music. Special attention will be paid to the following rāgas :

Yamana ; Hamira ; Kedāra ; Khamāja ; Todi ; Jai-jayovanti ; Vasanta ; Puriyā ; Multāni ; Mālakosa ; Bahāra ; Kāmōda ; Durgā ; Vrindabani-sāranga ; Miyānmallāra ; Purvi ; Sohani ; Jhidjhoti Bilāwala ; Ādānā.

Students will be required to know the system of tuning the instruments and how to effect simple repairs and the names of important types of musical instruments in India.

Two gats of each raga have to be learned—one Mashit-Khani, and one Raza-Khani.

Books recommended :—

Hindustani Sangit Kramika Series, Part IV, by Pt. V. N. Bhatkhande, published by V. S. Sukathankar, Solicitor, Malabar Hills, Bombay 2.

Selection from Muarful-naghmat by Raja Nawab Ali, Bhatkhande University, Lucknow.

Gitta-Sura-Sura by Krishnadhan Banerji.

Sangita-Chandrika by Gopeshwar Banerji.

Raga-vijnana by Prof. V. N. Parwardhan Gandharva Maha Vidyalaya, Poona.

Talim-Sitar by Prof. Hamid Husain, Marris Music College, Lucknow.

Sitara-marga by S. P. Banerji, Marris College, Lucknow.

Shastra-Pravesha, Part IV.

A short Historical Survey of the Music of Upper India by Pt. V. N. Bhatkhande, Bhatkhande, University, Lucknow.

Tansangraha Parts I and II by S. N. Ratanjankar Marris Music College, Lucknow.

Rag Darshan, Parts II and III, Gandharva Mahavidyalaya Mandal, Allahabad.

Sangit of India ; by Mrs. Atiya Begum, Villa Atiya, Ridgewood, Bombay.

Hindustani Music by the late Pt. V. N. Bhatkhande.

Sangit Kaumudi by Mr. V. S. Nigam, Morries Sangit College of Music, Lucknow. Sangit Pravash by Pt. Krishna Rao Pandit, Shankar Ghandharv Vidyalaya, Lashkar, Gwalior.

System of Music in North India in 15th, 16th 17th and 18th Centuries by the late Pt. V. N. Bhatkhande.

Note.—(1) Students offering vocal music should know how to tune Tambura.

(2) Students offering Tabla are required to play the Thekas meant for Dhrupada and Dhamara on Mridanga (Pakhawaja).

**Scheme of Examination and Study for the
Certificate of Social Service and village
uplift work**

PAPER I.

General Course with special reference to India :—

1. Contemporary Social Service work in India and abroad. 3 Lectures

And a sketch of the Social Service activities.

2. Social Legislation. 1 Lecture.

The character and scope of Social Legislation in India.

3. Education. 4 Lectures.

The social Function of Education; the School as a social centre; education of juveniles, and criminals; night schools; adult education. Library movement, Scouting.

4. Welfare Work 2 Lectures,

Settlements, Recreation, Playgrounds, Temperance work.

5. Social Survey. 1 Lecture.
Social surveys.

6. Organisation of public welfare, 2 Lectures.
Organisation of Social Service centres, Melas Budget, Accounts. Reports, etc.

PAPER II

7. Rural Problems and their Remedies. 4 Lectures

8. Cottage Industries —1 Lecture.

9. Indian Labour Problems—2 lectures. Conditions of work in Factories and Industrial centres: Labour wages, Health Housing, Recreation.

10. The Panchayat System—1 Lecture.
11. Co-operative Societies—2 Lectures.

PAPER III

Hygiene and Sanitation.—

12. Domestic Hygiene, Cleanliness of the home and surroundings, Principles of health. Essentials of Diet. 2 lectures.

13. *Sanitation—*

(a) Village Sanitation, Problem of the drains, manure, disposal of Sewage. The activities of the Public Health Department in rural areas. 2 lectures.

(b) Urban Sanitation Drains. Roads, Over-crowding. 1 lecture.

- 14, *Medical Lectures :—*

Preventable, contagious and infectious diseases
Their causes and remedies. 3 Lectures.

Books recommended :—

1. SIR CHARLES BADFORD : Elementary Hygiene for India.
2. SIR RONALD ROSS : Hygiene.

PRACTICAL OR FIELD WORK FOR 7 DAYS

The main purpose is to give first hand experience to each student under proper supervision. The work will comprise :—

1. Visiting villages and studying their economic and sanitary conditions and establishing welfare centres.
2. Visits to slums.
3. Social survey.
4. Practical work in sanitation in villages.
5. Visiting and conducting education centres.
6. Practical acquaintance with the work of Co-operative societies.
7. A report on the conditions observed and work done. The Report will contain specific headings such as Rural conditions, Education, Sanitation, Co-operative Societies, Temperance.

The students will take their Reports on Practical work to the Viva Examination.

Every student shall pay an annual fee of Rs. 6 and an examination fee of Rs. 5/-.

Books recommended :—

Paper I. General Course (Social Welfare)—

1. ELMER—Technique of Social Surveys.
2. FARQUHAR—Religious Movements in India (last chapter).
3. Cambridge History, Vol. VI.
4. W. I. MCKEE—Developing a village curriculum for Village Schools in India.
5. The House of the People (Government Printing Office, 1932, Washington D.C., U.S.A.).
6. DR. P. S. LOKANATHAN—Industrial Welfare in India.
7. P. P. PILLAI—India and the I.L.O.
8. A. B. MANDE—A Scheme of Adult Education.
9. DR. F. LAUBACH—Towards a Literate World.
10. DEVINE—Principles of Relief.
11. R. V. PARMAR—Technique of Rural Reconstruction.
12. SHIVA RAO—Industrial Worker in India.
13. NYEM WALES—China Builds for Democracy.

14. F. LAUBACH—India Shall be Literate.

Paper II—Economic Conditions—

1. P. J. THOMAS—The Problem of Rural Indebtedness.
2. B. G. BHATNAGAR—Co-operative Organization in India.
3. D. SPENCER HATCH—Further Upward in Rural India.

Paper III—Hygiene and Sanitation—

1. DUNN AND PANDYA Indian Hygiene and Public Health.
2. SOUSA—Popular Hygiene.
3. GHOSH—Hygiene and Public Health with Special Reference to Chapters VII, VIII, XII, XIV, XVIII—XXI, XXIII—XXV.
4. CRUICKSHANK—Food and Physical Fitness.

Diploma Course in Physical Education

1. Only the students of the University will be admitted to the course.
- 2 The course will be a one year's course.

The examination will comprise of two papers and a practical examination.

Candidates for the diploma course will be required to pass in the written as well as in the practical examination separately.

The following syllabus is recommended :—

There will be two papers.

Paper I—

- (a) History of Physical Education.
- (b) Principles and Methods of Physical Education.
- (c) Diet, Nutrition and Problems of Health.

Paper II—

- (a) Education Psychology.
- (b) Anatomy.
- (c) Physiology.
- (d) Hygiene.
- (e) Theory of games and athletics.
- (f) Terminology and Class Commanding.

It shall be open to a student to specialise in some subject such as Tennis or Cricket or Gymnastics.

Intensified training will be given in special subject and the fact that he has made a special study will be mentioned in the diploma.

PRACTICAL COURSE

1. Educational gymnastics.
2. Games and athletics.
3. Class commanding.
4. School practice.
5. Aquatics.
6. Remedial gymnastics and massage.

The marks will be allotted as follows :—

Paper I	..	..	100
Paper II	..	..	100
Practical	..	..	100
			<hr/>
Total		..	300

The Supervisor is required to produce at the practical examination the class records of the students, which will be taken into consideration in determining the results of the examination.

Out of 100 marks in Practical, 20 will be set apart for class record.

TIME TABLE

The subjects will be taught in the following Departments and the time-table to be fixed in con-

sultation with the Head of the Department concerned.

At the Gymnasium :

1. History of Physical Education.
2. Principles and Methods of Physical Education.
3. Terminology and class commanding.
4. Theory of games and athletics.

In the Philosophy Department :

Education Psychology.

In the Zoology Department by the University

Doctor :

1. Anatomy.
2. Physiology.
3. Hygiene.
4. First aid and athletic injuries.

Time-table for the practical work will be from 7 to 8-30 in the morning and 4 to 5-30 in the evening.

The school practice to be fixed up in consultation with the Heads of the institutions.

Local Self-Government Diploma Course

There shall be four papers, a *viva voce* and a Practical training test each carrying 100 marks as follows :—

Paper I—Principles of Local Self-Government and the Principal systems of Local Government found in the world, Particularly the English, American, French and German. Constitution of Local bodies ; Central Local relations ; functions—Education, Sanitation, Trading etc.

Books recommended :—

J. S. MILL :—Representative Government (The chapter on Local Government).

H. FINER :—English Local Government. (Selected).

HARRIS :—Local Government in many lands.

W. B. MUNRO :—Government in European Cities.

W. B. MUNRO :—Government of American Cities.

PERCEY ASLEY :—Local and Central Government.

J. WATSON GRICE :—National and Local Finance.

Journal of Public Administration (selected Articles.)

Paper II—Local Self-Government in India with special reference to the U. P. The Historical Background, Municipalities, District Boards, Village Panchayats, their constitution and Functions.

Books recommended :

P. MUKERJI :—Indian Constitutional Documents, Vol. I. (Relevant Documents).

The U. P. Municipalities Act 1916 as amended up-to-date.

The U. P. District Boards Act 1922 as amended up-to-date.

Gaon Panchayat Hukumat Act, when enacted by the Provincial Legislature.

The U. P. Municipal and District Board Manuals.

K. T. SHAH :—Indian Municipalities.

JOHN MATTHAI :—Village government in British India.

M. P. SHARMA :—Local Government and Finance in the U P.

Paper III—Local Finance and Accounts with special reference to the Local Bodies in the U. P. Local revenues and expenditure Assessment, Budget-making and Appropriation. Grants-in-aid. Borrowing. Accounts, Audit and Surcharge.

Books recommended :

BASTABLE : Public Finance (Book I, Chapter 7, Book III Chap. 6, Book V, Chap. 8, Book VI Chap. 4 .

GYAN CHAND : Local Finance in India.

SHAH : Constitution, Functions and Finance of Indian Municipalities, Book III.

U. P. Municipal Account Code.

U. P. District Board Manual—Chapter VII.

Audit and Surcharge rules.

Introduction to Indian Government Audit and Accounts (Selections).

Paper IV—Principles of Town Planning, Land Acquisition, Problems arising in connection with Municipal Engineering,

Water-Works, Waste Disposal and Sewerage, Public Health.

Books recommended :

U. P. Municipal and District Board, Land Acquisition Rules.

U. P. Town Improvement Act 1919 and rules made thereunder.

LEWIS—Planning of the Modern City.

MUNRO—Municipal Administration (Selected).

DUNN and PANDYA—‘Elements of Hygiene and Public Health’ (Non-technical portions only).

The Practical Training Test

By arrangement with neighbouring local bodies, students are to be sent up to them simultaneously in groups of 5 to 6 for a period of about 6 weeks in the months of January, February and March to work there under the guidance of Secretaries, Executive officers or other officers so as to gain first-hand knowledge and experience of the working of these bodies. They will be expected particularly to familiarize themselves with management problems, organisation, personnel administration, accounting,

procedure specially financial, budgeting, office practice, purchasing of stores, etc. After the training every student will be required to submit a thesis based on the first-hand knowledge acquired in the course of practical training. The 100 marks allotted to the practical training test will be awarded on the basis of this thesis and the reports from the officers under whose guidance the student may have worked.

Viva Voce

The Viva Voce will be based both on the theoretical knowledge and the practical experience that the students have gained.

Syllabus for the Diploma in Painting

PAINTING.

The course for the first year will be as follows :—

Practical.

- (a) Memory drawing and picture composition (simple).
- (b) Design and Colour.
- (c) Still Life and Silhouettes.

The course for the second year will be as follows :—

Theory

- (a) History of Indian Art.
- (b) Art Structure and Applied Forms.
- (c) Anatomy.

Practical.

- (a) Advanced Memory drawing and picture composition.
- (b) Advanced designing.
- (c) Outdoor sketches with perspectives.

Diploma Examination will be held at the end of the second year and the total marks will be 500 which will be distributed as follows :—

(i) Theory—two sections :—

- (a) History of Indian Art ;
- (b) Technique Marks 100.

(ii) Work of the candidate during the Course 200 marks.

(iii) Practical Examination (for 2 days).
Session of 3 hours each, 200 marks.

The successful candidates will be placed in two classes :—

Class I—Those who obtain 60 per cent. or more marks.

Class II—Those who obtain between 45 per cent and 60 per cent marks.

Books Recommended:

1. Indian Painting by Percy Brown. (The Heritage of India Series, Y. M. C. A. Publishing House, 5, Russell Street, Calcutta).
2. An Introduction to Indian Art by A. Coomarswami. (Theosophical Publishing House, Adyar, Madras).
3. Bhartiya Chitra Kala } By Rai Krishna
 „ Murti „ } (Nagri Pracharni Sabha, Benares).
4. Indian Artistic Anatomy by A. N. Tagore. (The Indian Society of Oriental Art, Samavaya, Mansions, Calcutta).
5. Ornamental Art by N. L. Bose. (The Indian Society of Oriental Art, Samavaya, Mansions, Calcutta).
6. A Primer of Art by Manohar Lal. (Ram Narain Lal and Sons, Allahabad) in Hindi and Urdu only. Chapter I consists of a brief survey of Indian Painting and Sculpture ; Chapter II, Principles of Art, Colour systems, etc., and the rest Design, Perspective, Technique, etc.
7. Art in Everyday Life by D. D. Sawyer (touches nearly all branches except painting in oils).

8. Art for Indian Schools by D. D. Sawyer (Blackie & Sons, Madras) (Same as No. 7 but brief).

9. Teachers' Manual Drawing by Weston (Thomas Nelson & Sons, Canada, probably).

10. Bhartiya Chitra Kala Paddhati by Shailendra Nath Dey. (The Indian Press, Ltd., Allahabad).

11. Drawing and Design by Harold Speed (for Library only).

PHOTOGRAPHY

All experiments must be neatly written up in a note-book which will be examined before the diploma is awarded.

Work methodically and fast, so as to finish each day's work in two periods. Do not waste materials. Treat all apparatus with care. Do not spill developer, etc., on the slides. Wash your dishes and put them up to drain before leaving.

PAPER

Elementary Photographic Optics.—Refraction of light, Dispersion, Lenses, Image formation, principal focus and Focal length, Size of image, Intensity of image, Speed of lens, Diaphragm

notation, Depth of focus, Factors controlling depth of focus, Variation of aperture with distance of subject. Defects of image; Chromatic and Spherical aberration, Curvature of field, distortion, Astigmatism.

Types of Lenses:—Single, Simple achromatic Anastigmats; Symmetrical and double; Telephoto and wide angle objectives.

Photographic Camera:—Principal parts and their functions, various types of shutters, View finders, Rising, Falling and Cross front movements. Swing backs. Focussing systems. Attachments and accessories.

Types of Cameras:—Pinhole. Box. Studio, Field, Pocket folding, Single and double lens. Reflex, Miniature, Stereoscopic. Choice of Cameras and sizes.

Photographic Emulsion:—Types of emulsion and their constituents. Grain size and its effect on image. Speed of emulsions.

Exposure:—Correct exposure and its determination. Exposure meters. Colour Filters and their use.

Theory of Development.—Various constituents of the developer and their actions. Various

developing agents and developers. Velocity and time of development. Effect of temperature. Characteristic curve. Elementary ideas of gamma and its control.

Technique of Development:—Various methods of determining time of development. Fine grain development. Tropical development. Mechanism of fixing, effect of temperature and concentration on time of fixing, use of acid hardening agents, exhaustion of fixing bath, Mechanism of washing, methods of eliminating hypo and testing its presence. desensitization, Tank development. Drying.

Contact Printing:—Developing papers: characteristics, grades and selection. Exposure, development, fixing, washing, drying. P.O.P. and self-toning papers.

Projection Printing:—Types of enlargers and methods of illumination. Determination of exposure, selection of paper, Projection control of the image.

Defects of Negatives and Prints:—Causes of thin or dense negatives, flat or hard prints, various stains, spots, etc.; their removal or prevention., Miscellaneous troubles.

After Treatment of Negatives and prints:—
Intensification, reduction. Retouching and finishing
Toning of prints.

*Colour Photography:—*Additive and Subtractive processes: Colour transparencies; Exposure, Development; Limitation of contrast, Latitude and fidelity of colour reproduction. Colour slides.

*Darkrooms:—*Layout & equipment. Safelights.

*Portrait Photography:—*Principles of portrait. Lighting. Arrangement of Models. Backgrounds. Modelling, tones and textures.

Copying and Photo-Micrography.

Principles of Photographic Pictorialism:—
Elements of composition, Arrangement of lines and tones. Rendering of colour contrasts in monochrome. Principles of perspective.

*Application of Photography:—*Brief treatment.

**Practical Course in Photography list of
experiments**

1. Examination of Cameras.
2. Photographing indoor and outdoor subjects on films and plates.
3. Developing and fixing of negatives,
4. Printing of negatives on different papers.

**PROSPECTUS—EXAM. FOR DIP. IN APPLIED ARTS 745
AND CRAFTS**

5. Examination of the effects of different developers and varying exposures.

6. Photographing an object with different lenses.

7. Enlargements.

8. Toning of prints, intensification, and reduction of negatives.

9. Use of filters.

10. Copying.

11. Photo-micrography.

12. Retouching and finishing.

Books recommended :—

1. Text Book of Photography, Allahabad University.

2. Ilford's Manual of Photography.

**The Examination for a diploma in Applied
Arts and Crafts (for girls students only).**

One paper in theory.

This paper shall deal only with the history of Indian art and be in fact the same as the paper in Theory for the Diploma of Painting. This paper shall carry 100 marks.

The course approved for the Practical is as follows : —

746 PROSPECTUS—EXAM. FOR DIP. IN APPLIED ARTS
AND CRAFTS

1st Year Diploma Course.

- (a) Drawing.
- (b) Design (Simple designs and folk designs).
- (c) Embroidery.
- (d) Leather work (Batik and relief).
- (e) Applique Work.

2nd Year Diploma Course.

- (a) Advanced drawing (Both Eastern and Western style).
- (b) Designs (More elaborate designs. Folk designs especially Alpona).
- (c) Pottery painting.
- (d) Leather work (Batik, relief Patch and mat work.)
- (e) Advanced embroidery.

That in the Final year greater attention shall be given to creative designs.

The Practical examination be held on the basis of (a) the Home Work of the candidate and (b) a Practical Paper.

That the Practical Paper be of six hours duration and that it shall carry 200 marks. 200 marks be allotted to the candidate's Home Work.

That there will be only two divisions and candidates getting 60% or above shall be placed in the 1st division and those candidates who secure from 45% to 59% shall be placed in the 2nd division.

NOTICE

TERMS CASH

The Publication of the University are not sent per Value Payable Post. Payment should be made in advance in cash or by Money Order.

The following Publications can be had on application to the Registrar, University of Allahabad :—

			Price			Postage (including Registration)		
			Rs.	a.	p.	Rs.	a.	p.
Calendar 1939	...	...	5	0	0	0	11	0
„ 1941	...	...	5	0	0	0	11	0
„ 1943 and 1944	...	...	5	0	0	0	11	0
Prospectus for 1944	...	...	0	8		0	8	0
Do. 1945	...	...	1	0	0	0	8	0
Do. 1948	..	..	1	8	0	0	8	0
Do. 1950	...	...	2	0	0	0	9	0
Minutes of the Allahabad University for 1936 (Bound in one volume)			5	0	0	0	12	0
Do. 1940	...	...	5	0	0	0	12	0
Do. 1941	...	...	5	0	0	0	12	0
Do. 1942	...	...	5	0	0	0	12	0
Do. 1943	...	...	5	0	0	0	12	0
Calendar of Graduates from 1889—1927			2	0	0	0	11	0
1928—1938			2	0	0	0	7	0
University Studies (Annual Publication)			7	8	0			
Lectures on Shankra Vedanta by Mm. Dr. Sir Ganganatha Jha, M.A., D.LITT., LL.D. Unbound			2	8	0	0	7	0
Bound			3	0	0	0	8	0
Lectures on Urdu Language and Literature by Sir Abdul Qadir, Kt.			4	0	0	0	8	0

